NSU's Revolutionary New Engine - P. 56

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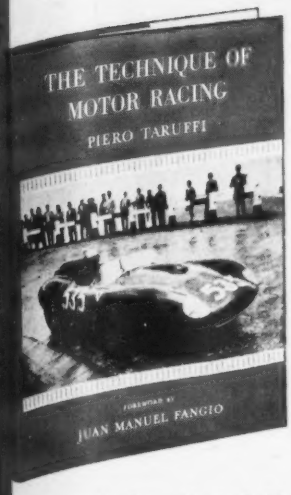

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"In years of experience I think he beats us all — from his first win, in 1923 to his final victory for Ferrari in the 1957 Mille Miglia; it was always his ambition to win this event, one of the great, open road races that are no more. The value of these years of experience when passed on to the younger generation is tremendous — but it is rare that the hand that holds the steering wheel can do equal justice to the pen. Taruffi is fortunate in having both these gifts; his assessment of the qualities necessary for success is the best I have seen, and he is right in putting enthusiasm first. Without it, the other qualities, however great, are valueless. **"A young driver's progress will be greatly assisted by taking his advice, and absorbing all he has to say, not only about the technical aspects but the many other sides of motor racing with which he deals.** The rest lies in a man's own personal make-up — those peculiar, intangible assets of mind and body which no text-book can describe, no formula resolve, but which provide the final inspiration . . . the stock-in trade of the great driver."

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This month's cover depicts the two new Fiats tested in this issue. The interior is that of the 2100 sedan, with the 1200 TV Roadster reflected in the mirror. Photograph by Anim Gallery.

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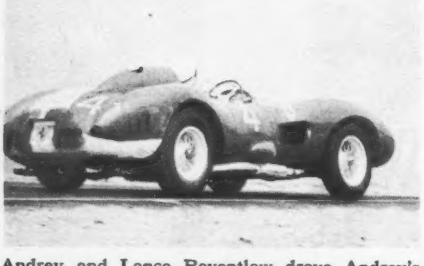
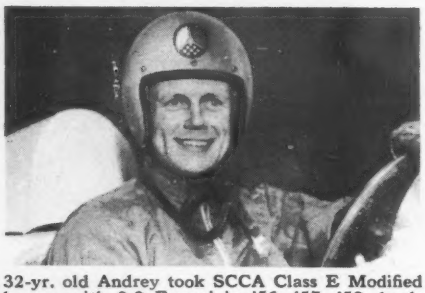


Andrey and Lance Reventlow drove Andrey's 4.1-litre Ferrari to big over-all win in 1958 500-miler at Elkhart Lake.



32-yr. old Andrey took SCCA Class E Modified honors with 2.0 Ferrari in '56, '57, '58; leads (at time of this writing) in '59.

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OBSERVATION AND OPINION

► As I've mentioned before here, we knew 1960 would be a banner year for cars. SCI has already discussed the pace-setting compacts and this month presents the formidable array of new cars we're being offered from overseas. Normally evolutionary, automotive progress has developed some blooming mutant strains after prolonged irradiation by competition and technical advances. These things we knew and rejoiced in. In a realm and an era in which the elimination of a valve seat insert in an aluminum cylinder head must be regarded as a major technological breakthrough, we could ask for little more.

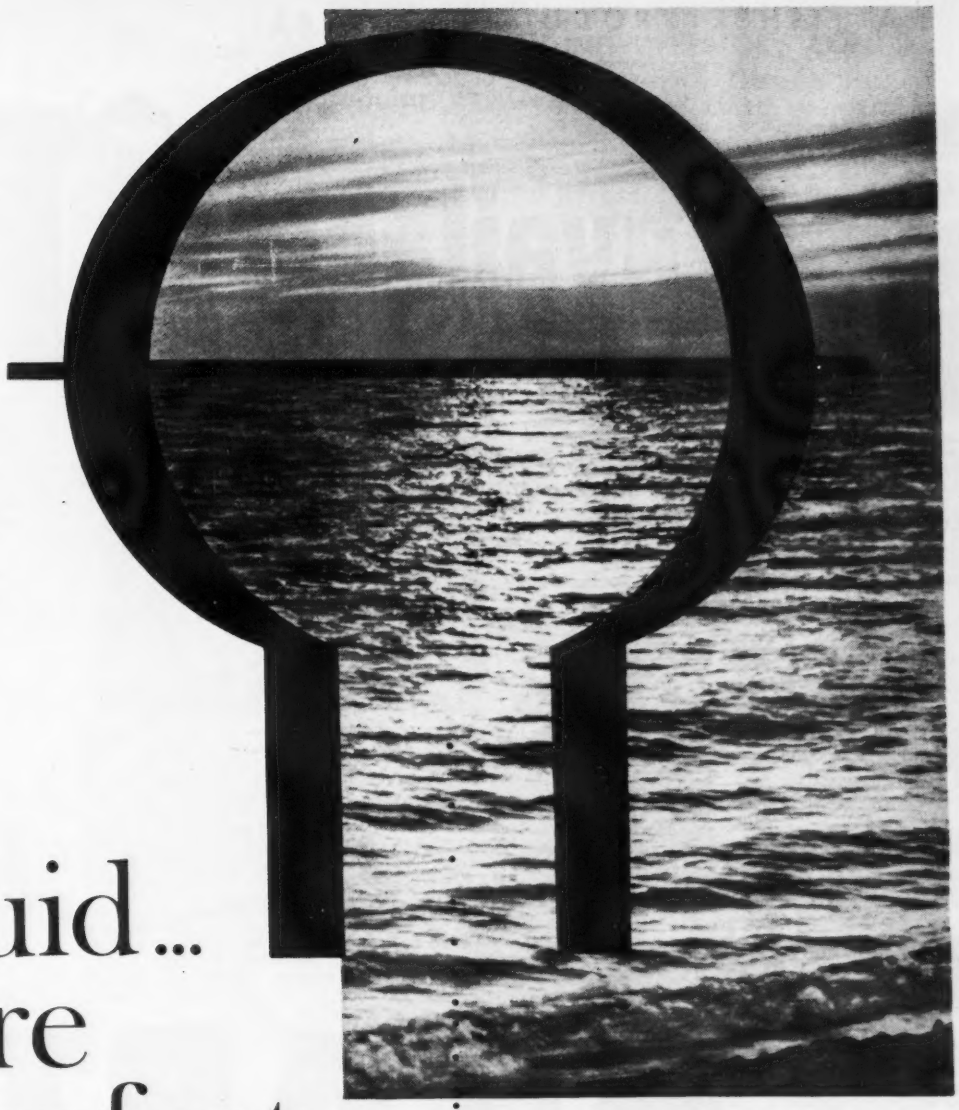
But now the oft-too-stable world of cars has been rocked to its foundations by two fascinating revelations that make us realize how crude our methods are today and how generous the future appears to be. The first, least violent, is Pirelli's new tire, and the second, most fundamental, is NSU's new engine. Whatever the technical merits of these two developments, they reflect a kind of thinking that can mean a lot to the world in the next decade: they make very economical use of their materials. In both cases very much more is accomplished with the same, if not less, physical goods, a refreshing change from the usual automotive concept of progress by complication.

At a time when the mechanics of existence threaten to overwhelm us mere human beings, also, the incredible simplicity of Dr. Wankel's power-producer for NSU and Curtiss-Wright is extremely encouraging. As is already becoming evident in other fields, our tools for accomplishing things become neater and more effective as the fundamentals of the world around us are better understood. After we round a certain datum point in scientific history, the more we know the simpler our life should be—and not the opposite, as is now generally the case.

In this issue SCI has taken some pains with a detailed explanation of the operation of a rotating combustion engine, feeling as we do that its influence on future car design is likely to be so great that the limits can barely be glimpsed today. For example, it may now be an easy matter to equip each wheel of an automobile with an individual engine. If units of NSU size were to be developed for light weight, a 40 horsepower engine weighing no more than 20 pounds could be fitted within each wheel, for a total of 160 horses, and if their full promise is realized no supplementary transmissions would be required. And if we think in terms of racing formulae all existing standards of performance are shattered. NSU could construct an engine for the 1961 Grand Prix formula that would extract 270 bhp from 91 cubic inches of swept volume, and weigh not much more than 180 pounds! Just as a matter of interest, NSU's "Rennmax" 250 cc motorcycle engine of 1954 set new standards of output in its class by delivering 39 bhp at 11,500 rpm, unblown. Dr. Wankel's engine of the same size easily surpasses this output at less rpm, and doubtless delivers far more punch at low speeds. To put it simply: the rotating combustion engine seems to start where the reciprocating version stops.

Against the above background it's hard to get excited about any new events in the sports car engine world, but Lloyd Taylor's new homegrown powerplant certainly merits a lot of attention. When first covered by SCI in March and April of 1958, its construction was outstanding but its design rather dated. Now it's sprouted another cam and a full racing top-end design and, with the variety of sizes offered, it threatens to be the American Coventry Climax—as long as adequate production facilities can be made available. Beginning in March of this year, deliveries will depend on the orders and cash on hand. If you want one, inquire of T. C. Tyce at the Tyce Engineering Corporation, 809 "G" Street, Chula Vista, California. This, gentlemen, is a venture that is worth encouraging.

Karl E. Ludvigsen



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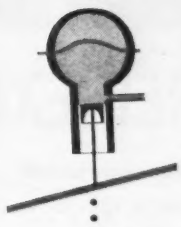

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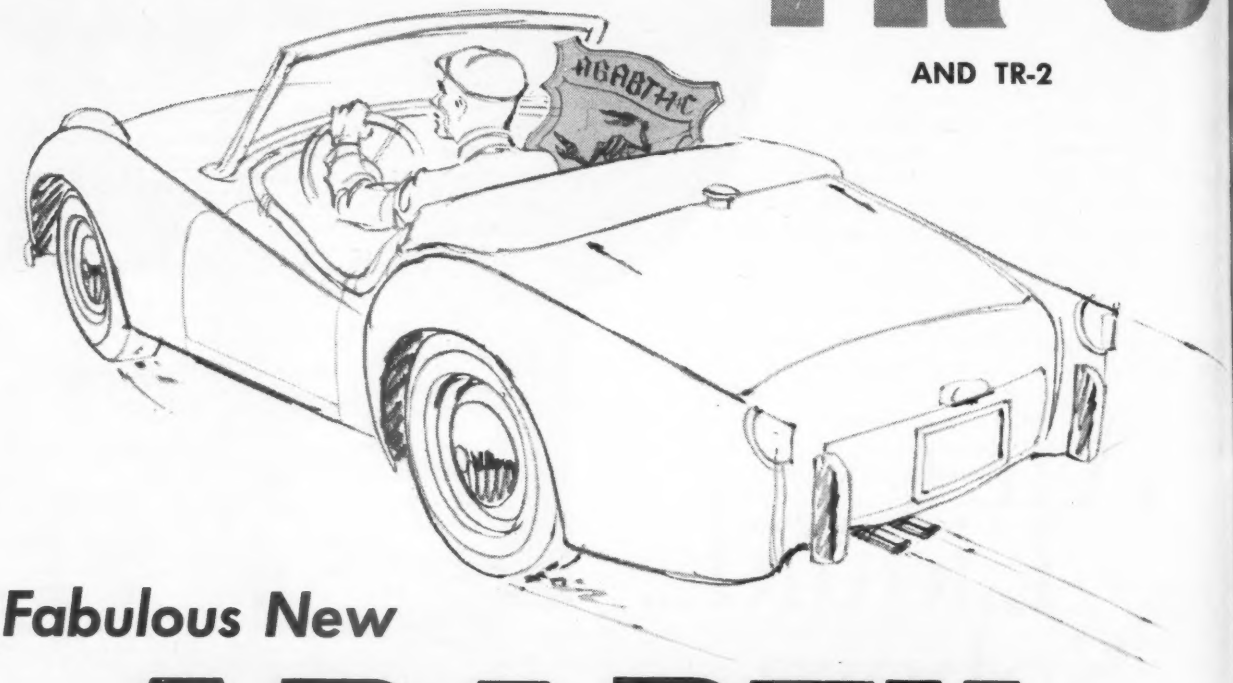

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LETTERS

ECHIDNA AT MEADOWDALE

I would like to point out a slight error in a description of a picture which appeared in conjunction with an article in your latest issue. The article is "Malt, Hops & the Dancing Midget" which was the result of Mr. Van der Feen's excellent coverage of the Labor Day Meadowdale race.

The error appears under the picture of the three cars of Pabst, Ruby and Echidna #64 which states that Pabst in the Scarab laps an Echidna. This is not the case. The Echidna pictured ran in one of the two heats in the race on Sunday and actually was ahead of the Scarab for 20 of the 25 laps in this heat.

The picture was taken during the lap which was run prior to the start, the start being a rolling one due to the midget. The reason that Mr. Ruby is ahead at this time is that occasional spurts were necessary during this lap, which was quite slow, to prevent plug fouling.

Grierson Automotive Specialties
John Staver
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CAMORADI MASERATI

Having spent the better part of the day with Lucky Casner at the USAC formula libre program at Meadowdale, I was most interested in Dic Van der Feen's story, "Malt, Hops and the Dancing Midget" in the December SCI.

I thought possibly your readers might be interested in some amplification of Mr. Van der Feen's statement that the Camoradi USA 250F Maserati was "...tired machinery, weakly driven."

The day before the race, Zora Duntov spun the car out and put it up on the bank near the silo, tearing up the tail section, splitting the fuel tank and, as it turned out later, damaging the valve gear quite extensively when he was unable to get the car out of gear and the engine was turned over backwards.

The result was that the night before the race was spent in repairing the fuel tank. In practice, Duntov was unable to get more than 6600 rpm on the front straight, 600 under peak and 1000 under what Casner hoped for. Magneto trouble was suspected, but Red Byron, of the Micro-Lube team, analyzed the problem as being in the valve gear.

Lucky then considered withdrawing the car, fearful that the whole works might blow, but decided against it because, as he said, "a lot of people came to see this machine run." The end result was, of course, a sad performance that culminated in a shunt between the Maser, with Paul O'Shea aboard in the second heat, and Loyal Katskee's Ferrari.

After Lucky got the car back to Florida, a tear-down revealed that the "only" damage to the valve train was three slightly bent valves and six broken valve springs.

(Continued on page 12)

Marion Weber's FASCINATING LIFE STORY CONT'D

by popular request

I have always been a great believer in science. In fact when I was a girl I wanted to be a great inventor, but when my parents confiscated my Gilbert #4 chemistry set (after finding out that I was distilling alcohol from old potatoes) I turned to other ambitions. Fascinated by the Ballet, I decided to become a prima ballerina. I went to Chicago and studied until my calves ached. Ballet terms like **entre chat, tour j'ete, pas de deux, bunions, fallen arches** became my vocabulary. I lived, breathed and ate ballet... until I had to switch to solid food. Then the theatre beckoned, and I feel that I might have attained great heights but my husband, Charlie, insisted that I leave the stage for fear I would catch pneumonia. My boss, a wonderful old gentleman named Minsky, was devastated. **Next month: How I came to California and invented smog.**

I don't know if you can call this an invention or not, but I designed it myself... with the help of some of our better race drivers... and have had a few made for the cognoscenti. You too can have one if you get your order in quickly. What is it? Well, it's a kind of **racing driver's carry all.** A wonderfully rugged dark green nylon soft bag that is made to retain a helmet with bubble shield, two pairs of goggles, gloves, racing shoes, two suits of coveralls, toilet kit, swim suit, stop watch, shirt, underwear and socks and even a camera. In short... everything the driver needs and doesn't want scattered all over the lot. Only 14" x 16" in size, it is designed to go under an airplane seat so that it can be kept with you. The **Carry All** is padded, zippered, well made, lined with flannel. Also included is a separate flannel pouch for goggles or shield... no scratch.

This is what a lot of guys have been waiting and expect to pay much more for. But the full price is only **$12.95**

You enthusiasts are in for a treat when you come to grips with the hilarious new 64 page book of cartoons called MY ENGINE IS MISSING. A perceptive young man named Homer has produced this gem... and if you are perceptive you will recognize the people, places and situations so cleverly delineated. Get two copies, because your original will undoubtedly be borrowed so much you'll never have it at home. **$2.95**

Other books that you should have include:
OMNIBUS OF SPEED **$5.95**
HOW TO TUNE YOUR FOREIGN CAR **$2.00**
RALLIES, TRIALS & GYMKHANAS **$6.00**

DIG THESE GOOFY TOPS FOR ONLY $29.95

Do you own an MG TC, TD, TF, Healey, TR, Jag, Corvette, Morris Minor, Hillman or Volks Convertible?

If so you can replace that beat up rag that is now letting the wind, rain, snow, sleet or sand (in Texas) filter into your scalp with ease and without going in debt. ANYONE can come up with $29.95 (or only $33.95 for an MGA) for one of our 3-ply deluxe fabric 18-month guarantee tops. Fit it yourself and pocket the difference. Write for free catalog that gives all details on this and many other bargains... just address: Marion, P.O. Box 4156, Catalina Station, Dept. 2, Pasadena, Calif., and it will be mailed in plain wrapper.

Keep Komfortable with a Komfort Muff might be the slogan but it isn't. A K.M. gets your car up to operating temp quicker, saves gas, makes heater hotter. For MG, JAG, HEALEY, TR (Specify) only.....**$3.95**

THRESHOLD PLATES of rigidized aluminum protect finish in busy doorway of Alfa, Porsche, TR, MGA..**$3.95 pr.**
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KICK PLATES to prevent door panels from scuffs and rubber marks on MG, TR, Healey, Porsche, are another bargain at .....**$3.95 pr.**
Sprite .....**$3.50 pr.**

PLASTIC BEADING slips over regular bead for extra attractive look. Clear or red, 4 pcs. **$1.25**

MGA ASH TRAY-LIGHTER in sturdy black leatherette covered case has deep well for ashes, pop-out lighter unit. Fits between armrest and gear lever. **$8.95**

AMCO CRESTED KNOBS for MG, Healey, TR, Sprite, (plus St. Christopher or checkered flag design to fit all imports & Corvette) are husky size (2" across) give a solid feel to the change lever. Heavily chrome plated, the crests are raised out of a black baked enamel background. Dresses up the interior of your car tastefully. **$2.95**

FOR THE CAR THAT HAS EVERYTHING... a 24 karat gold plated shift knob. Same designs as above but finished in real gold then protectively coated in clear plastic to last. Strictly for the owner who **really** cares. **$5.95**

Other knob selections include:
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4" EXTENSION with 40° bend puts lever in comfortable reach. For **Renault, Jag 2.4, 3.4, Porsche, Morris** or **Volks** **$1.35**

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If you aren't covering your car you are losing money every day the sun shines or the dust blows. The soon-visible effects of weathering reduce the trade-in value in time-proven fashion... and unless you plan to take it with you, someday you'll sell or trade. Get the most at that time by getting a mitten now. If your car isn't listed here, write for prices. No charge.

	Lightweight Sun and Dust Cover	DURICON Water Repellent
☐ MG Mitten ☐ Healey Hugger ☐ Alfa Apron (Rdstr.) ☐ Fiat Frock (1100TV)	$17.95	$24.50
☐ Morris Muff ☐ Renault Romper ☐ Ghia Gown ☐ Porsche Parka ☐ Peugeot Pegnoir ☐ Minx Muff ☐ Fiat Frock (600) ☐ Saab Sack	$22.95	$29.50
☐ Corvette Cap ☐ Thunderbird Tepee ☐ Jaguar Jacket (140, 150, 3.4) ☐ Mercedes Muff (190, 300 SL)	$27.95	$32.50
☐ Volvo Vest ☐ Vest for Volkswagen	$22.95	$29.50

Calif. residents please add 4% sales tax. We pay postage on all prepaid orders... 20% deposit on C.O.D.s required. MG Mitten Showroom: 1127 East Green Street, Pasadena. Lots of free off-street parking. Come in with BANKAMERICARD in hand and live a little.

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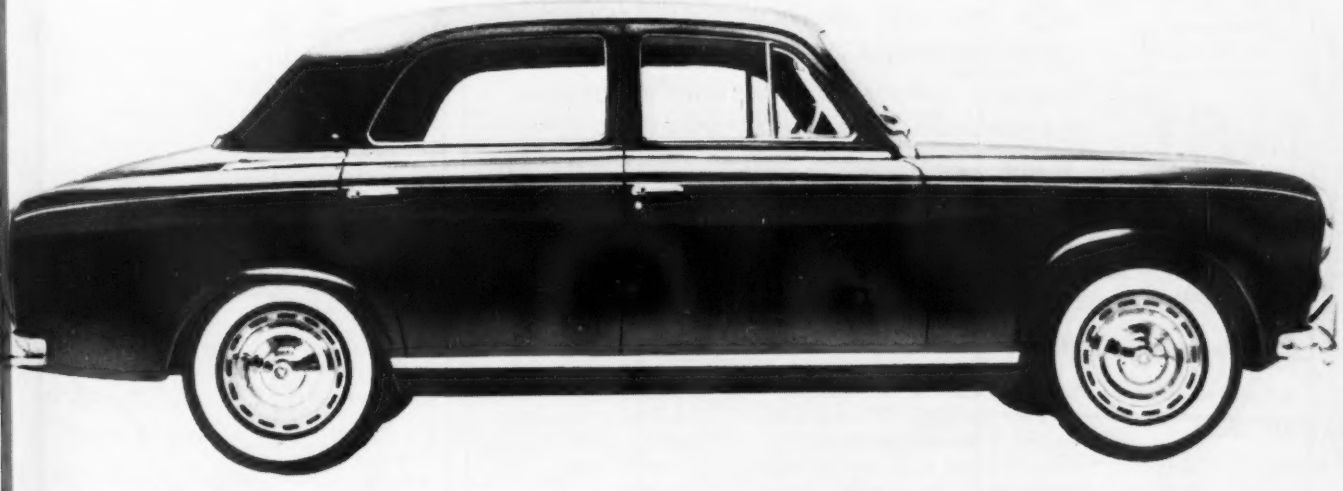
The remarkable achievement

Two years ago, few Americans had heard of the Peugeot 403. Fewer still could pronounce its name. Yet today, Peugeot is more widely known than scores of cars which have been here much longer. And it is outselling two-thirds of *all* imported cars. How did Peugeot achieve so much in so little time? It is, to begin with, a remarkable blend of pleasing design, traditional craftsmanship, and realistic pricing. "The Peugeot 403 is loaded with quality" reports *Sports Cars Illustrated* Magazine. Over 250,000 hours were spent on design and engineering of the 403 before it was put into production. At the assembly plant in Sochaux, France, one of every 17 employees is an inspector. *Every* car must pass more than 2,000 individual inspections before it leaves the factory. *Every* car is then carefully road tested. Peugeot has remarkable room and comfort. It seats 5 to 6 adults and has a 20 cu. ft. "big car" trunk. Peugeot is an economical car. Its 4-cylinder engine delivers 30 mpg on regular gas. And there are no "optional extras." The price of $2250 at East and Gulf Coast ports of entry is a full-equipped price. Included are: sliding sun-roof, whitewall or Michelin X tires, 4-speed synchromesh transmission, heater-defroster, padded dashboard, cloth or leatherette upholstery, reclining seats, electric clock, windshield washers, trip mileage counter, wheel trim rings and an outside rear-view mirror. American owners find that Peugeot maintenance is very good and very fast. Each of Peugeot's 500 dealers must stock an unusually large number of spare parts. Peugeot distributors carry an additional back-up supply of parts worth over three million

of the Peugeot 403

dollars. All dealer mechanics attend training schools staffed by Peugeot factory engineers. Refresher courses are regularly conducted by a staff of traveling service experts. Owners like Peugeot's responsiveness. You drive it—it does not drive you. They like Peugeot's traditional design, too. It is clean of line, trim, uncluttered. As one man said: "This car has dignity." Some people say "Peugeot" like this: "Pooj-Oh." Others avoid the question and just say "403." Use whichever you wish when you visit your Peugeot dealer. While there you may also wish to drive the Peugeot Station Wagon—America's *largest* imported station wagon, $2490.

Sold and serviced by over 500 Peugeot dealers throughout the United States, Canada and Mexico. For illustrated brochure, write: Peugeot, Inc., Room 3109. 750 Third Ave., N.Y. 17, N. Y. For overseas delivery see your nearest dealer or write: Cars Overseas Inc., Box 158, Long Island City 4, N. Y.



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Shows condition of coil, condenser, points, plugs and ignition wiring; detects breaker point bounce and facilitates dwell-time setting. Displays complete engine cycle or just one cylinder at a time. A switch selects either primary or secondary circuit patterns; or alternately, provides choice of "parade" or "superimposed" secondary patterns. Works with any internal combustion engine with coil ignition and accessible breaker points. Can be used with car in motion and under load when powered by an appropriate DC-AC inverter.

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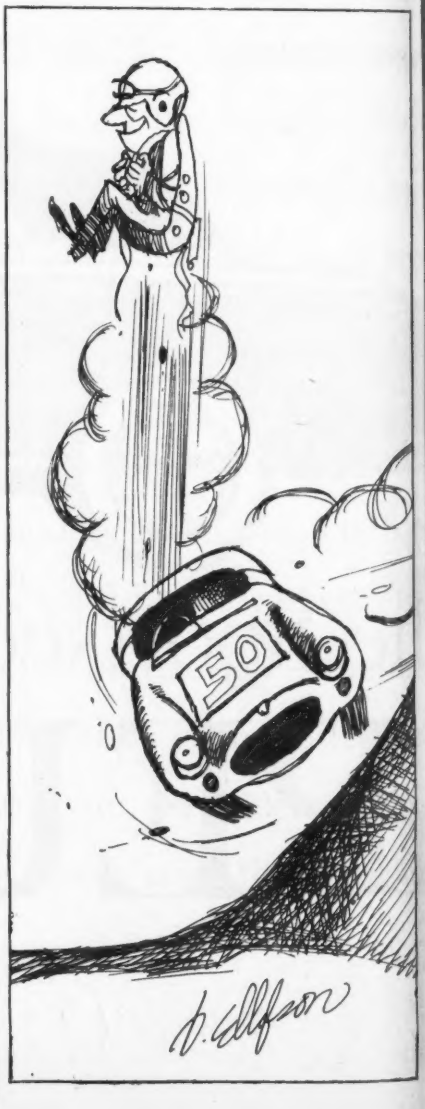
LETTERS

(Continued from page 9)

This car and a similar one are being re-powered with modified Corvette engines for formula libre campaigning next year. The first stop will be the New Zealand Grand Prix in January, with Rodger Ward and Jim Rathmann driving.

Bob Morrison
Cleveland Heights, Ohio

We were pleased to get this inside view of the Camoradi Maserati's difficulties, with which we sympathize deeply. With Corvette engines the 250F's should be effective formula libre campaigners. Lucky Casner, director of Camoradi, expected to have Valerio Colotti's Tec-Mec Grand Prix car in the U.S. in time for Sebring and for later G.P. events. The Tec-Mec surrounds a 250F Maserati engine and gearbox with a new compact space frame, wishbone-type independent suspension all around, and Girling disc brakes. One intention of the original project was to supply an up-to-date chassis in which Maser owners could install their engines and transmissions, but it is not known at present whether additional chassis will be built at the Modena factory. Other cars being operated under the Camoradi aegis are two RSK Porsches, a two-liter Maserati, 750 cc Osca, and hopefully, a single-seater Porsche.



BAKERS OWN DOUBLE SLIDING WINDOWS

THE WINDOW WITH THE SNUG ALL-WEATHER FIT FOR COMFORTABLE WINTER DRIVING

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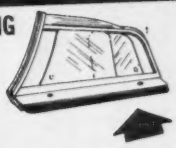

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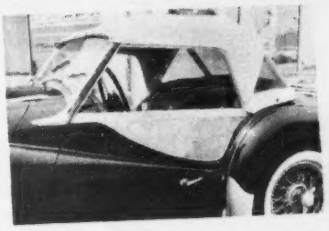
- Both windows fit snugly — and both slide, too.
- All aluminum welded frame. No ugly braces.
- Spring loaded weatherproof seals cannot loosen.
- No cloth or felt used — nothing to rot or deteriorate.
- Attractive polished chrome-like lustre.
- Many adjustment points assure perfect fit, even with damaged doors, bad roof alignment, etc. Our clear, concise installation charts should answer your problems. (Or we'll be happy to have our experts install them for you.)



TRIUMPH 1-UNIT DOUBLE SLIDING WINDOW

With crackle finish aluminum apron. Fits hard tops too. Specify DZUS or Slip-In mounting.

PAIR—$80.95 EACH—$43.50

MGA WINDOW

Special insulation won't loosen when door closes.

THEY SAID IT COULDN'T BE DONE!

AUSTIN HEALEY 4 & 6 CYL. WINDOWS

PAIR—$70.15 EACH—$38.00

PRICES (8% Fed. Tax Included)	PER PAIR	EACH
MGA	$70.15	$37.95
A. H. Sprite	61.51	33.75
Porsche Speedster	61.51	33.75
MG TD & TF	80.95	43.50
Jaguar XK 120 & XK 140	80.95	43.50

Please add $2.00 packing, shipping, insurance

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Our desire is to manufacture products that last. We feel that chrome does not stand wear and weather nearly as well as the stainless steel or aluminum alloys used in all BAKERS products.

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WRAP AROUND CONSTRUCTION • PROTECTS BUMPER, FENDERS AND LIGHTS

Heavy Gauge Temp-Alum tubing used in BAKERS guards. tensile str. 33,000 lbs. per sq. in.

- ★ Made of Temp-Alum aircraft metal.
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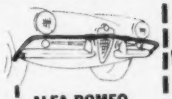
- ★ Double reinforced sleeves at all anchoring points.
- ★ Extra heavy wall tubing (see diagram at left).
- ★ There's a custom design for every imported and American car. If yours isn't shown, write for prices.



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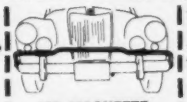
Front—$27.95
Rear—$30.45



MG MAGNETTE
Front—$27.95
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SAAB (Std.)
Front—$24.95
Rear—$22.95

PEUGEOT
Front—$22.95
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NOW AVAILABLE FOR ALL 1960 U.S. CARS!

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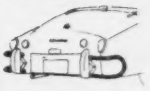

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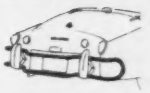

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Guard prices: Add $2.00 shipping

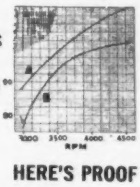
BAKERS FREE-FLOW PREMIUM QUALITY MUFFLERS

UNIQUE CONSTRUCTION—NO POWER LOSS! ADDED POWER, BUT NO EXCESSIVE NOISE!

NO BETTER MUFFLER AT ANY PRICE

COMPARE THESE FEATURES

- Heavy welded steel exterior.
- Honeycomb heavy steel silencing core for longest life.
- Tightly packed fiberglass inside. No baffle plates to block power. Means longer engine life, better pickup, lower vibration.
- Pleasing low tone.



HERE'S PROOF

BAKERS muffler (A) gives better power at all engine speeds, compared to conventional baffle plate design (B)

MUFFLER PRICES
tax included

Austin A-30, A-35	6.25
A-40	9.25
A-90 W'minster	13.95
AH 4 cyl. 1 in 1 out	$11.75
English Ford A100E series	12.50
Mark I, Consul	12.50
Mark I Zephyr	13.95
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Fiat Conversion 600	15.95
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MG TF & TD	11.75
Magnette	12.50
Mercedes 190SL Rear 180, 190, 220, 300	24.75
Morris Minor 1000	9.25
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Front	13.95
Jaguar XK150, 3, 4, Mk 7, XK120	24.75
Jaguar XK120 sports —twin pipe	49.50

Muffler Prices—Add $1.50 for Shipping, etc. • Flex Units—Add $1.00

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Increases power, improves performance. Replaces all 1949-on. 2 outlets. $22.50

RENAULT DAUPHINE & 4CV

Its design keeps engine cleaner inside.

Dauphine—2 outlet—$15.50
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All models. Heavy duty. Longer life. $12.50

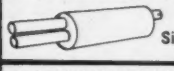
TRUMPH TR2-3-3A SPORTS CONVERSION

Bakers Muffler plus polished aluminum tail pipe. Mellow bellow tone. $19.95

MG, TD & TF MUFFLER WITH ALUMINUM EXHAUST PIPE

Polished end, with clamp. $18.25

MGA & SPRITE DOUBLE OUTLET MUFFLER $15.50



Single outlet—$11.75

AUSTIN HEALEY KITS

6 Cyl. Kit—Servais muffler, two exhaust pipes, special hangers, 4 clamps, $29.95
4 Cyl. Kit—Servais muffler, two exhaust pipes, special hangers, 3 clamps, $29.95

Side outlet means greater ground clearance. Fewer replacements.

AUSTIN HEALEY OR JAG FLEX UNIT

4 & 6 cyl.
Double gauge, flexible stainless steel. 2 clamps included.
A.H. $9.95 ea. • JAGUAR $6.95 ea.

AUSTIN HEALEY 4 CYL. FRONT HEADER

Extra heavy steel pipe with stainless steel flexible section $16.95

ALL PRICES INCLUDE 8% FEDERAL EXCISE TAX

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★ CANADIAN BUYERS—FOR CONVENIENCE, PICK UP PURCHASES AT U.S. BORDER. WRITE FOR DETAILS.
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★ WHEN NEAR NEW YORK, PICK UP PURCHASES OR HAVE THEM INSTALLED AT OUR FACTORY WHILE YOU WAIT.

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ALUMINUM SPORTS CAR DECK RACKS

Don't drill holes in your paint job. Temporary installation with permanent look & security. Padded stainless steel straps give best weight distribution, protect finish.

26x18"	28x18"	35x18"
$22.95	$34.95	$39.95

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MG, TD & TF LUGGAGE RACKS

Anodized aluminum. Mounts over spare tire. Does not obstruct rear view. Luggage strap included.

Folding Rack (rear folds up) $45.95
Non-Folding rack 29.95
Add $2.00 shipping

TRIUMPH TR-2, 3 LOCKING GAS CAP

Stainless steel, with adapter. **REDUCED to $9.95.** Add $1.00 shipping.

PLEASE SPECIFY MAKE, MODEL AND YEAR WHEN ORDERING

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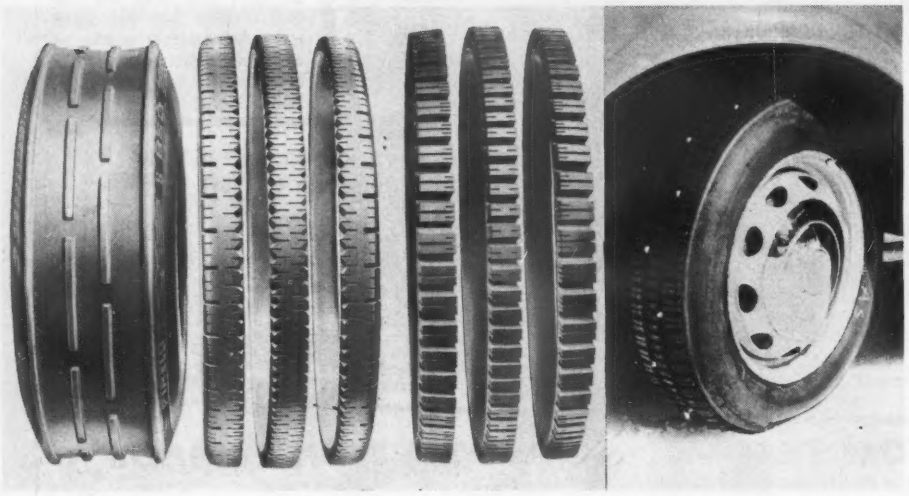
EUROPEAN NEWSLETTER



At left above is shown the ribbed carcass of Pirelli's remarkable new tire, the breaks in the ribs serving as anchors for the tungsten-carbide-tipped spikes seen fitted in the photo at the right. Separate sets of tread rings for summer (left) and winter (right) can be fitted as is necessary.

TIRE BREAKTHROUGH

A significant development in tire design was recently announced by the Pirelli Company. The new tire is called the BS-3 (Batistrada Separata-Separate Tread). The BS-3 carcass has three flat-bottomed grooves running around what would be the tread area on a regular tire. Tread rings—built with a steel-wire backing—are forced over the deflated carcass and seated in the grooves. The three rings are locked into place when the complete tire is inflated. Many advantages accrue from this type of construction. Worn tread rings—only 35 per cent of the total cost of the tire—can be replaced. Different tread patterns to suit different road conditions can be used. Initial production has so far been limited to only two treads—one for dry roads, and a winter pattern that can be fitted with steel spikes for use on glare ice. The carcass can be made flexible—it is in fact about the same as that used in the Pirelli Cinturato—while the tread section can be fairly rigid. This means that a large portion of the flexing imposed by corning forces will be absorbed by the walls of the tire, consequently a larger area of the rigid tread will remain in contact with the road. The BS 3 has been proved safe up to 124 mph, while its behavior after a blowout is like that of any other tire. The valve on the BS 3 tube features a new type of air seal. The Pirelli people discovered during work on their new tire that during a blowout most of the air does not escape through the puncture, but through the space between the valve and the rim. Over and above the new features and obvious advantages of the BS 3, Pirelli claims exceptional braking and road-holding qualities, plus silent running.

DAIMLER GT?

Over at "the Daimler," Coventry's oldest factory, Edward Turner of Triumph Twin fame is stirring things up. His genius for engine design—strange for a Chairman of B.S.A. to be an engineer—has already given us the 2½ litre SP 250 developing 137 bhp at 5800 rpm in a relatively undeveloped state. 220 is said to be possible with eight carburettors and a cam based on motor cycle practice. With little extra effort the same design has been scaled up to 4½ liters and propels the Majestic saloon at speeds which make one wince. For the record the only difference between this engine and the SP 250 designwise is a modified tappet angle.

SHORROCK SPRITE

The Shorrock Supercharger must be one of the most used blowers in the world, when considering the subject of record-breaking. Recent M.G. and Healey-Sprite records at Bonneville have shown the value of this equipment, the output of the twin-cam EX 181 engine being boosted into the region of 260 b.h.p.: this blower was specially designed for the job and at maximum r.p.m. was absorbing almost a quarter of the actual b.h.p. At the other end of the scale the writer knows of examples of the cooking Shorrock which have been applied to 3 or 4 cars in succession thereby amassing a road mileage of as much as 100,000 without failure or undue wear. The Shorrock started life as the Centric of pre-war repute, only in post-war times taking the name of its designers and propagators, the Shorrock brothers. Now the Healey Company of Warwick are proposing to put on the market a supercharged and generally superior version of the Austin-Healey-Sprite. Bearing in mind the bonus given to the performance of this car by the blower it should surely be called the Shorrock Sprite, for the engine power is raised from the normal 45 bhp to 68 bhp at 5700 rpm with additional benefits in the way of smoothness and low speed torque. To gain an idea of the benefits attained, acceleration time from standstill to 50 mph is reduced from 13.7 to 8.2 secs, 70 mph is reached in 14.8 instead of 31.1 secs. and maximum speed is raised from 81 to more than 90 mph.

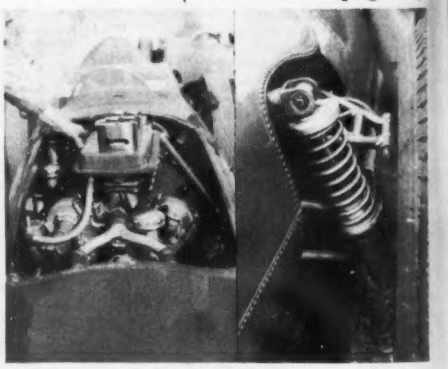
GROWING BABY

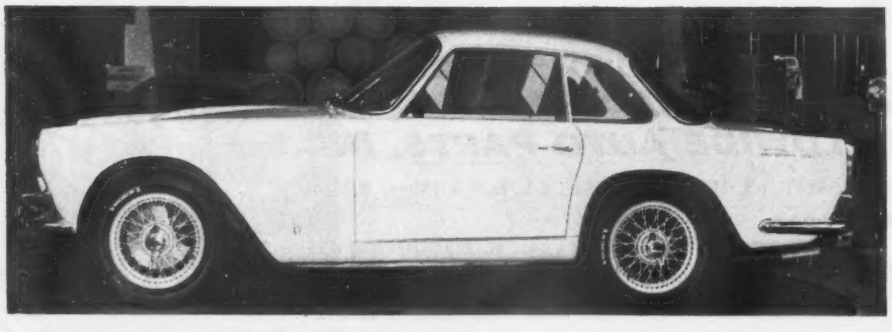
Latest official information on the Ferrarina coupe—baby Ferrari to the less "in" types—is that it will be bodied by Scaglietti, and be fitted with Dunlop discs on all four wheels. The chassis and floor pan are based on the Fiat 1100 coupe. Body panels will be steel, with doors fabricated in aluminum. When finished, it will be very Farina-like in appearance—complete with scaled-down egg-crate grille.

FERRARI FOR SEBRING

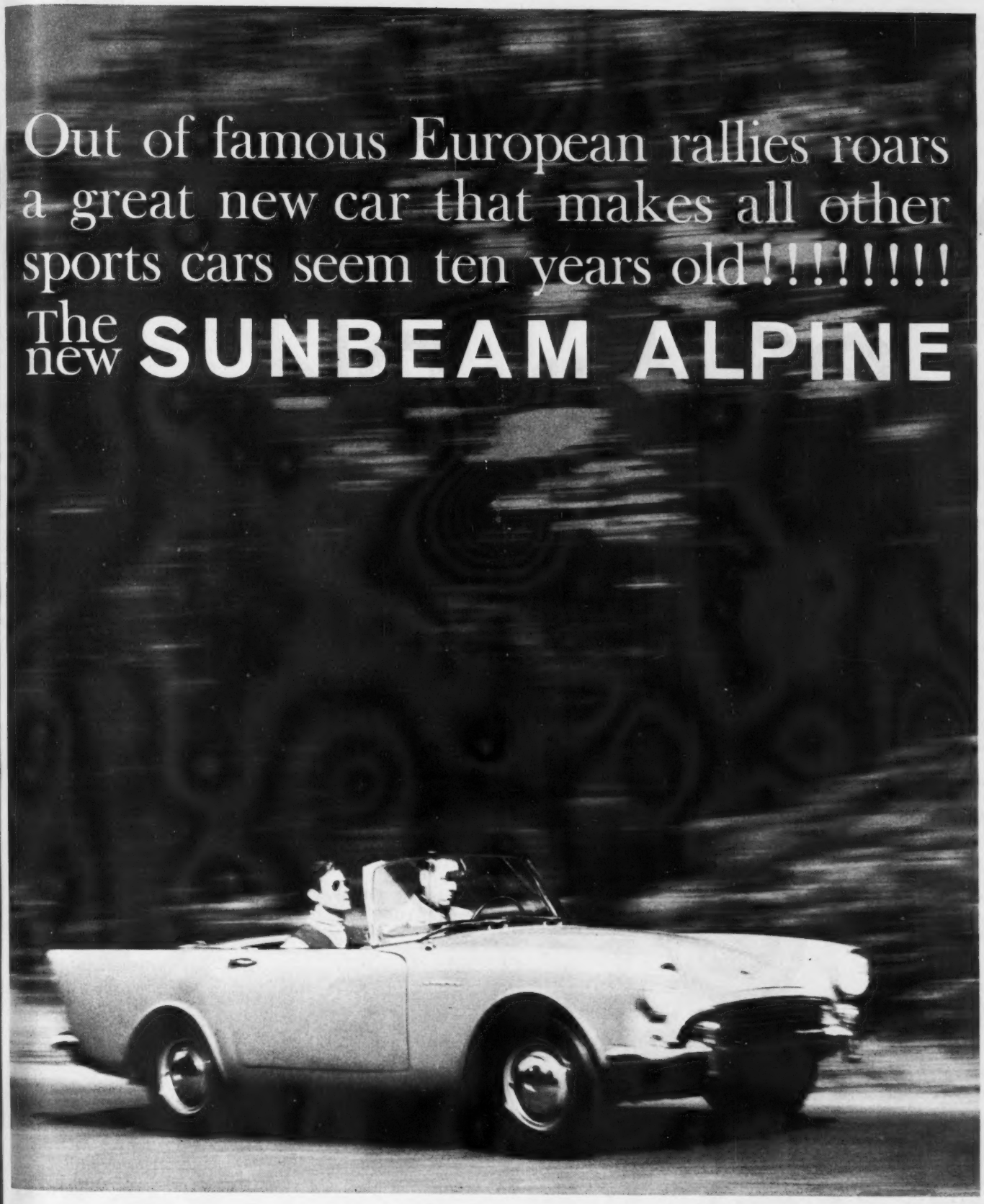
Cliff Allison recently tested at Modena two different Ferrari GP cars. The one intended for Sebring had a Dino 256 engine, normal bodywork, and a Cooper-like wishbone rear suspension instead of the usual de Dion set up. The other was a Formula II car fitted with a 2.2 liter, single cam Dino engine. Allison commented that the smaller engine was quite flexible compared to the 256 unit. A few days later the same two cars were tried by Tony Brooks. Emphasis during this session was placed on testing the car with the new rear suspension. The lean Englishman was reported to be quite enthusiastic about the new car's handling.

(Continued on page 18)





Directly above are two end-of-season Ferrari experiments, the bored-out single-cam Dino and the independent rear suspension, both on the Grand Prix car chassis. Also from Italy, at left, is Vignale's Italia coupe on the TR3 chassis. He's building one a day.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a great new car that makes all other
sports cars seem ten years old!!!!!!!!
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It has everything a sports car ought to have! The full sweep of clean, clear lines. Comfort. Roll-up windows. Full-size doors. Wrap-around windshield. Removable hardtop.* Room. Jump seat for kids or extra luggage. A rally-bred sports car engine. Powerful performance. Tremendous acceleration. Superb safety disc brakes. Road-hugging balance. See the newest and neatest look in sports cars – the all-weather design of the Sunbeam Alpine. Test-drive the Sunbeam Alpine at your Hillman/Sunbeam dealers, now! *Optional, extra.

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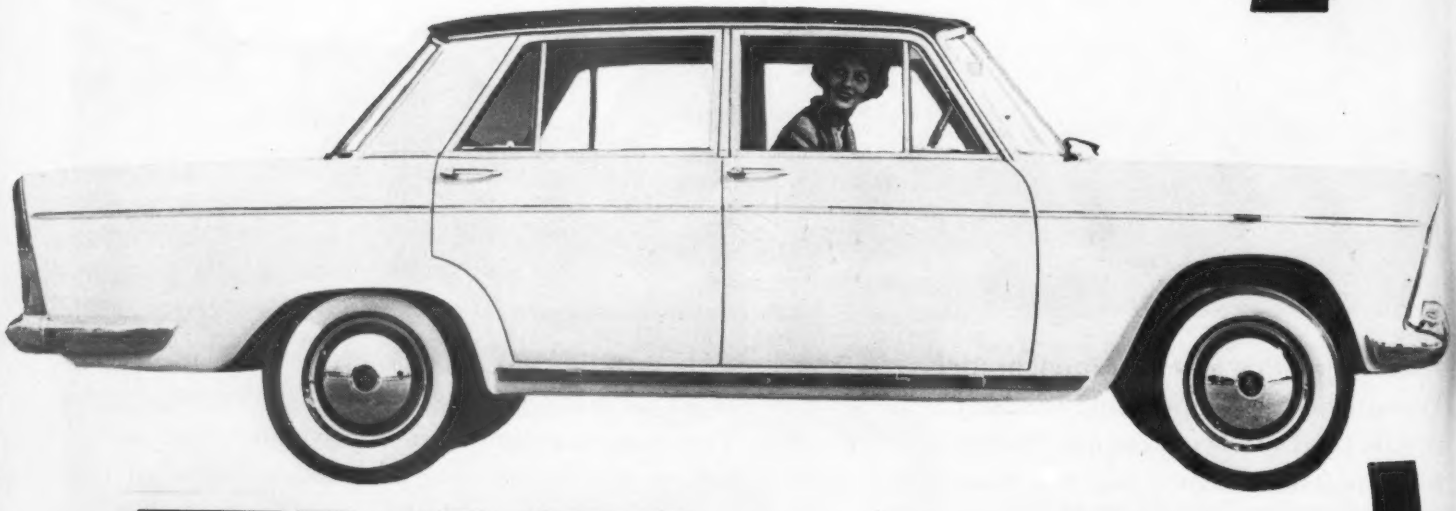
Three New Members Of An Old Reliable Family

Over sixty years ago, the Fiat heritage was born. Since that time, a long line of fine automobiles has added lustre and distinction to the Fiat name . . . And, today, three new members of this fine family of motor cars are making their debut. A product of thoroughbred background and 60 years of engineering know-how, these three cars proudly take their place alongside the other members of a distinguished family.

Fiat now has 18 models in 6 series with prices starting at $1098*



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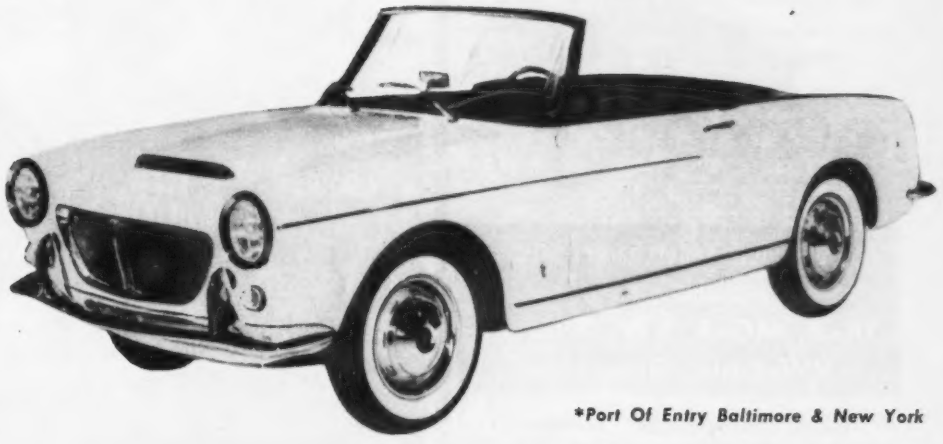
FIAT

1200 SPYDER • 2100 STATION WAGON • 2100 SEDAN

The Fiat 1200 Spyder has an entirely new body, designed by Farina, along with a higher output 63 horsepower four cylinder engine. The sleek new body features smoother, straighter lines and a disappearing top which folds away behind the seats. The 63 horsepower engine has a compression ratio of 8.25 to 1 and produces a top speed of 90 miles per hour. *The Fiat Spyder is also available with the new 90 horsepower 1500 c.c. Osca twin-cam engine, capable of 105 miles per hour.*

Fiat 1200 Spyder.....$2812*

Fiat 1500 Spyder.....$3730*



**Port Of Entry Baltimore & New York*

The Fiat 2100 Sedan is the first Fiat to feature the completely new Fiat 6 cylinder engine. Not excessively large, it is nimble in traffic and seats 6 passengers comfortably. Other features are: 2054 c.c. engine developing 95 horsepower, 4 speed all synchromesh transmission, large luggage compartment, fully adjustable and folding front seats, a luxurious interior and curved windows front and rear offering full visibility.

Fiat 2100 Sedan.....$2998*

Though it retains the elegance and fine lines of the 2100 Sedan, the Station Wagon affords a wider field of utility for the fun loving family. Like the Sedan, it features a 95 horsepower engine, 8.8 to 1 compression ratio, 4 speed all synchronized transmission, positive action, highly efficient brakes, wide curved glass both front and rear, fully equipped instrument panel and separately adjustable front seats.

Fiat 2100 Station Wagon.....$3250*

ROOSEVELT AUTOMOBILE CO.

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HOFFMAN MOTOR CAR CO., INC.

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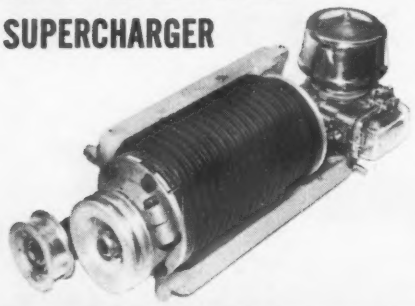
50% MORE HORSEPOWER

WHEN YOU NEED IT WITH A JUDSON SUPERCHARGER



Complete supercharger kits available for the
TR-3, MG-A, VW, 190 SL, VW-Ghia, Dauphine

A Judson Supercharger provides real sports car performance for the TR-3, 190 SL, MG-A and VW-Ghia. It provides big car performance with small car economy for the Volkswagen and the Dauphine. You are getting only half the performance and driving pleasure that you should if you own one of these cars and it is not supercharged by Judson. It provides lightning fast acceleration, reserve power for any emergency, better control for safer driving, immediate throttle response in any gear and a new thrill in driving. The difference in performance between the supercharged and unsupercharged car is truly amazing and immediately apparent.

Only Judson furnishes a complete supercharger installation in the form of a bolt on kit designed for a specific engine. Here is a supercharger that automatically replaces the vacuum in the manifold with a pressure in proportion to the load placed on the engine. The Judson Supercharger is bringing improved performance and complete satisfaction to over 60,000 owners throughout the world. Unsolicited letters from hundreds of enthusiastic owners and road tests made by all leading auto magazines prove conclusively the efficiency and reliability of our product.

WRITE TODAY FOR LITERATURE

SUPERCHARGED by JUDSON

JUDSON

RESEARCH AND MFG. CO.
CONSHOHOCKEN. PA.

EUROPEAN NEWSLETTER

from page 14

Having the inside track with Chrysler, Ghia was quick to build a coupe on the Valiant chassis, as below. A very practical dream from the same firm is the rear-engined Selene prototype, above.

TO THE MOON

European body builders seldom produce out and out dream cars intended only for display. Recently, however, Ghia unveiled Selene—moon in Greek mythology—a design study for rear-engined cars. Planned to accommodate six passengers on a wheelbase about equal to that of a Corvair, the Selene has a pilot and co-pilot arrangement with steering handles that can be swung from the left seat to the right seat. Duplicate two-pedal control is an added complication forced on the designers by the switchable steering gear. The four Moon passengers—placed aft of the control cabin—will really travel first class in individual contoured seats with a bar between the two rear-facing ones.

Much closer to realization, and also by Ghia, is a smart coupe on the Chrysler Valiant chassis. Called the Chrysler 250 Gran Tourismo, it is rather like a suit of evening clothes for the not-so-drab Valiant. Long—200 inches overall—but low—51 inches—the 250 might be slated for limited production. Lending strength to this rumor is the past collaboration of Ghia and Chrysler in the production of small numbers of elongated limousines for diplomatic use.

BMW MERGER

BMW recently announced that it has finally sold out to three German banks and Daimler-Benz. It is reported that this new combination will rescue the old-line Bavarian firm from complete failure. Only 18 per cent of the shares of the new corporation will remain in the hands of the old BMW concern. What will become of the present range of BMW cars has not yet been decided, but a spokesman for the company stated that his firm will probably start assembling Mercedes-Benz cars.

This move effectively kills all talk of an American Motors—BMW merger. Of interest to observers on the European auto scene is the growing girth of Mercedes-Benz. M-B has now absorbed its two biggest pre-war rivals—Auto Union and BMW.

IN THE WORKS

Not officially confirmed is the introduction next Spring of a 1600 cc car by Peugeot. If it goes into production the 404 will have a body by Farina—as does the present 403—with much of the Austin A-55 about it, except that it will be lower and less sculptured. A continuing grapevine item in France—aside from the wine—is the possibility of a 3 CV Citroen to replace the venerable 2 CV. Not sold in any great numbers in this country, the 2 CV has, during the past 11 years, almost replaced the bicycle in its native country. Naturally there is a steady flow of gossip about the possible future production of France's biggest producer—Renault. Two distinct new models are rumored. One is a 3 CV intended to replace our old love the 750 and/or a big car with hydropneumatic suspension to supersede the Frigate. The biggest problem facing Renault at the moment however, is how to produce enough Dauphines and Florides to fill the demand. This is one difficulty any manufacturer would like to face. Adequate production of present models might just prevent introduction of any new designs in the immediate future.

(Continued on page 74)

1960 RACING SEASON IS HERE

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JUST OFF THE PRESS — OUR 1960 REVISED CATALOG

Profusely illustrated catalogue containing hundreds of accessory items imported and domestic, representing our complete line. Catalogue of automotive accessories for the foreign and sports car owner and enthusiast. 50¢ ppd. (refundable on first order).

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RACING & DRIVING SUITS

IN: *White, Grey, French Racing Blue, Red, or Black*

ONE PIECE SUIT

$15.95 ppd.

These distinctive garments are original Italian racing suits. Preferred throughout Europe for comfort and utility. Not only most practical for races, rallies, are also excellent for informal lounging. Made to be laundered. Features—elastic gathered wrists, waists and ankles. Mandarin collar. Roomy pockets with heavy duty zipper closures. Tailored poplin fabric. Available in above colors. Men's sizes only: 36, 38, 40, 42, 44.

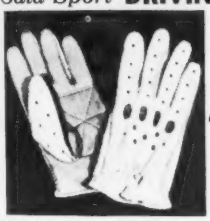
TWO PIECE RACING SUIT

$16.95 ppd.

(Pants, **$7.95**

Jacket, **$9.95**)

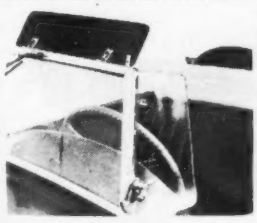
Sala-Sport DRIVING GLOVES



Driving Gloves **$7.95** per pr. ppd.

Racing Gloves **$7.50** per pr. ppd.

IMPORTED ITALIAN Sala-Sport gloves feature NON-SLIP GRIP. In skin-soft Italian leather, well ventilated, double leather palms. Four distinctive styles (except Shorties) in all sizes, including very small and very large: your choice of all black; tan and natural brown; white leather back and tan palm; knit back and brown palm. SHORTIES in knit back and brown palm only. Sizes: 6½-10 inclusive for ladies and gentlemen.



amco WIND WINGS and SUN VISORS

for driving comfort

All "amco" wind wings and sun visors have highly polished edges — Fittings are made of machined brass, triple chrome plated.

WIND WINGS

MGA; MG-TC-TD-TF; Triumph 2-3; Berkeley; Fiat 600-1100; Sprite **$16.95** per set ppd.

Austin-Healey 100/4 & 100/6; Jaguar XK120-140 Roadster; Alfa-Romeo; Porsche CPE; Mercedes 190SL **$19.95** per set ppd.

Karman-Ghia **$24.95** per set ppd.

SUN VISORS

MGA; MGA CPE; MG-TC-TD-TF; Triumph 2 & 3; Austin-Healey 100/6; Berkeley; Sprite, **$6.95** ea. ppd.

Jaguar XK120-140-150; Austin-Healey 100/4 **$7.95** ea. ppd.

Ski Racks by amco

$22.95 ppd.

No longer is it necessary to leave the top down or risk damage to your expensive ski equipment. The amco Ski Rack is crafted from heavy guage steel tubing, triple chrome plated and comes equipped with threaded clamps for holding two (2) sets of skiis and poles. The Rack sits on four suction cups and is attached to the deck lid with two aircraft type turnbuckles for easy attaching and positive slip-proof placement. Fits all sports cars with rear deck except Triumph and Sprite.

NEW *from* RAYDYOT

UNIVERSAL *Side Mount* **MIRROR**

Made in England. Raydyot's latest accessory, accentuates the distinctive appearance of your car. For mounting on side of door or next to windshield post. Self-tapping screws and rubber base washer included. Exquisite craftsmanship, triple chrome plated on brass. Pillar is reversible for use on left or right side. Specify your choice, Convex or Flat Mirror Glass.

SAFETY *Flick* **$1.95** *Switch*

ea. ppd. by "Raydyot"

Made in England. Completely new auxiliary switch as fitted to many leading cars as original equipment. positive toggle action with exclusive shaped operating lever. Perfect driver finger tip control means extra safety under night driving conditions. Specify your choice: White or Black Lever.

FIA APPROVED BRITISH MADE *Racing Mirrors* *by "Raydyot"*

$5.95 ea. ppd.

Shatterproof mirror in your choice of flat or convex glass mounted in streamlined spun aluminum cone housing. Wt. 5¾ oz. Adjustable base with positive locking device. Recommended for cowl mounting.

Enamel & Chrome *Cuff Links,* **$4.95** pr. ppd.

Tie Bars, **$2.95** ea. ppd.

Beautifully finished in rich vitreous enamel (jewellers' quality). Links double-hinged for ease of insertion and perfect comfort in use. De-Luxe pack—of velvet padded black plastic case with transparent lid. Emblem Cuff Links & Tie Bars available for: MG, TR, Jaguar, A-H, Alfa, Corvette, and many others.

OFFICIAL *Crossed Flags* **of Distinction**

Exclusively designed for us. Executed in full color. Jeweler's Enamel and beautiful chrome finish. Complete with mounting studs and nuts. Your choice of: USA/GT. BRITAIN; USA/FRANCE; USA/ITALY.

$3.95 ea. ppd.

FOREIGN CAR *Tire Chains*

Lug-reinforced, non-skid chains of extra-heavy construction. Although similar in design to regular chains, they are made from heavier material throughout and will endure the most severe motoring conditions. Prices F.O.B. Los Angeles. Prices of other sizes upon request.

5.20x13	$12.45
5.50/5.90x15	$13.95
5.00x15-5.20x14	$13.75
6.00x16	$16.95

Custom Chrome Gear Shift Knobs by amco

$2.95 ea. ppd.

Chrome plated Gear Shift Knobs of distinctive design with car crests, crossed flags and St. Christopher medallions in raised metal outline. Formed for comfortable, safe gear shifting. For: TR, Renault, A-H 100/4 & 100/6, MG, Mercedes 190SL, Sprite, Jag, Corvette, Volks, Porsche, Volvo.

BELL 500 TX* RACING *Crash Helmet*

New energy absorbing non-resilient liner as specified by the Snell Fund Study. This study conducted by Geo. G. Snively, M.D. is the first comprehensive racing crash helmet test ever made in this country. *Licensed by Topex. Sizes: 6¾" thru 7½".

Helmet with visor, $38.50 ppd., less visor $37.00 ppd.

BELL "500TX" *Bubble Shields*

Made of non-inflammable plastic. Are streamlined and shatter resistant. Tested at over 200 mph and gives undistorted vision.

	SNAP ON	FLIP UP
CLEAR BUBBLE SHIELD	$4.95 ppd.	$7.95 ppd.
CLEAR with SUNSHADE	5.50 ppd.	8.50 ppd.
TINTED BUBBLE SHIELD	5.50 ppd.	8.50 ppd.
TINTED with SUNSHADE	5.95 ppd.	8.95 ppd.

*Flip UP model comes in two sizes: SMALL, for sizes up to & incl. size 7; LARGE for sizes 7⅛ and larger.

THE WELL KNOWN DERRINGTON RACING *Steering Wheel*

$50.00 ppd.

State make, year, model of car.

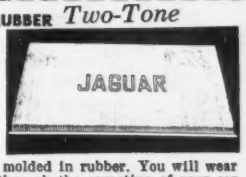
AH, Jag, MG-A, TC, TD, TF, TR 2 & 3, AC, Corvette, Porsche, Aston-Martin, Alfa Romeo 1300 only.

Duralumin one-piece frame with rim made in contrasting laminations of light African Obechi wood and rich dark Mahogany. Hand French polished, finger serrations for a much more firm grip. This wheel is slightly smaller in diameter (16") and allows an ease of handling not experienced with stock wheels. No driver who has tried one has ever failed to express his enthusiasm for the distinctive Derrington wheel. The purchase price includes all necessary fittings. (Corvette, 17" dia.)

HEAVY DUTY ALL RUBBER *Two-Tone Floor mats*

$7.00 per pr. ppd.

$3.50 each ppd.



With name of your car molded in rubber. You will wear heel marks completely through the carpeting of your car within three or four months if you do not protect it. High heels on passenger side are particularly destructive. Choice of colors. Red, Black, Blue, Green. STATE MAKE OF CAR. For: Mercedes; MGA; MG; Fiat; Triumph; Renault; Corvette; T-Bird; Alfa; Porsche; Austin-Healey; Hillman; Jaguar; Aston; RR; Morris; Morgan.

TO ORDER: Send check or money order. Enclose a minimum of ⅓ deposit for C.O.D. Calif. residents add 4% state tax. We extend a 10-day money back guarantee on all merchandise. When applicable, state size, style, color, and 2nd choice if acceptable.

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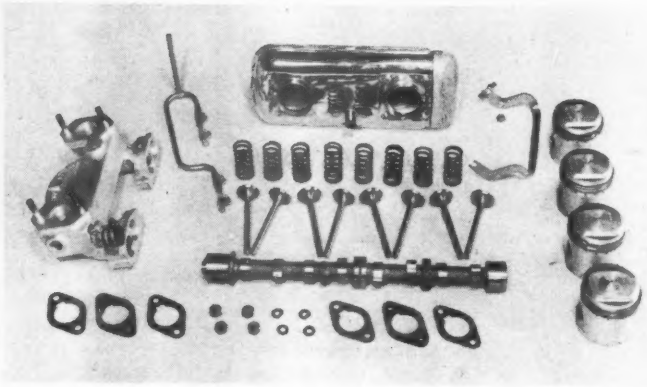
Just three blocks west of the Beverly Hilton Hotel

DEALERS INQUIRE

NEW PRODUCTS

This 17-jewel Benrus watch is known as the "Competition", and features an automobile crest on the face. The watch is waterproof, dustproof, and shock-resistant. Luminous hands and numerals are easy to read against the matte black finish of the face. The price is $35.75 including Federal Tax, plus $1.50 for postage, handling, and insurance. The "Competition" is available only from Pritchard-King, Inc., Short Hills, New Jersey.

The well dressed enthusiast might well be seen in one or more of these items offered by Continental Motors, 230 Wells Fargo Drive, P.O. Box 1302, Scottsdale, Arizona. Hand knitted Irish sweater for $30.00, Les Leston racing pants in flameproof poplin at $12.50, Leston racing boots at $14.00. Also available is a complete racing suit for $18.00.



Fiat owners who want more power will be interested in this modification kit from Nardi-Italia Distributors, 1147 North La Brea, Hollywood, California. Designed for the Fiat 1100, it is claimed to increase horsepower to 65 bhp. Other kits are available for Fiat 600/750. For prices write to Nardi-Italia.

The famous Zippo cigarette lighter is now available with engraved and color-filled sports car emblems. Emblems available are Austin-Healey, MG, Triumph, Porsche and Jaguar. Price is $4.75 postpaid from Hillson Sales, 1 Harper St., Stamford, N.Y.

More trunk space is available in most sports cars by simply removing the spare tire. Accessory Engineering, Box 415, Manhattan Beach, California, solves the problem of where to put it. A chrome-plated tubular steel frame supports the wheel which will not vibrate even at high speeds. Extension of the bumper is accomplished by the use of machined steel brackets, while the resulting space is filled with polished stainless steel plates, which may be painted if desired. Fits both wire and disc wheels at a price of $39.50 for either MGA or Triumph.

IMPORTANT NEWS ABOUT

ALFA ROMEO

The New 2000 is here!

Now added to the distinguished Alfa Romeo family is the exciting and beautiful new 2 Liter roadster styled by Carrozzeria Touring. You will be amazed at the lightning acceleration and silent power of this new great Alfa Romeo model. See and drive it to confirm that "Italians Build Such Exciting Cars."

GIULIETTA SPIDER 1300 cc, 91 hp, 96 mph **$3597**

GIULIETTA SUPER SPIDER 1300 cc, 103 hp, 118 mph **$3967**

GIULIETTA COUPE 1300 cc, 91 hp, 103 mph **$3931**

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DETROIT NEWSLETTER by Mike Davis

EDSEL: AUGUST 1957 — NOVEMBER 1959

► As predictable as it might have been, the demise of the Edsel hit the Detroit scene hard. This was the car — creation, even — of the crewcuts, the market researchers, the product planners. Edsel was designed to appeal to that well-known type, the rising young executive.

Even before Ford's answer to Dodge and Pontiac went on sale in the late summer of 1957, the pallor was upon the medium-priced market. The pace setters, the mode modelers were already shying away from Detroit's bedazzled behemoths. Southern California freeways and Connecticut lanes were reverberating to the putt-putt, the VAROOM! and the beep-beep.

In 1957, a whopping 50,393 Edsels were turned out before the new bright star on motordom's horizons began settling. The number dwindled with the Recession to 28,953 in 1958. Including a few thousand 1960 models — the best made and best looking of the lot — 1959 production of the Edsel mounted to 30,120. True, the Edsel was never a special-body offering of a luxury car; yes, more than a mere handful were produced. Yet we wonder if, in a few years, the Edsel might not be more than just a curiosity. What *will* be the collectors' delight of 1985?

The timing of the last swing of the axeman at Edsel's body politic came as a surprise. Middle executives in the division knew nothing until the day before the public announcement. Apparently once Ford executives were assured of the success of the Falcon and the reality of the economy market (for the Comet as well), the sword was allowed to fall.

NOSTALGIA DEPARTMENT

(If we had written this for last month's Newsletter, we'd be prophets — but truly we did write it before we had an inkling of Edsel's immediate fate.)

Thirty-five years ago, in 1925, some 53 different auto makes were turned out by U.S. producers. The top ten include some well-known brands and some long forgotten: (in order of registrations) Ford, Chevrolet, Buick, Dodge, Essex, Overland, Studebaker, Hudson, Nash and Star.

Wonder what another 35 years will do to the world's list of motor cars? There are those who say European auto makers are, market-wise, about where the U.S. was in the mid-twenties. Pontiac, which didn't exist as a nameplate in 1925, turned out its seven millionth car in mid-October. Edsel died in mid-November after only 26 months. And all but nine of the 53 in 1925 have gone the way of all flesh . . . ashes to ashes, rust to rust.

THERE'S A FOUR IN YOUR FUTURE

Let's talk about fours — Detroit fours. When market planners and engineers for the Big Three were in product planning stages for the Falcon, Corvair and Valiant, four-cylinder engines were considered — and then dropped.

Ford brain-pickers undoubtedly put in the most research on four-bangers at the consumer end. Early planning was very much in favor of the typical in-line OHV four-cylinder power plant in the Falcon, but was finally over-ruled for some good reasons:

1. Market research showed most potential customers wanted a six-passenger car, weighing somewhat more than a four or five passenger model.

2. Many would-be buyers indicated they would pay extra for automatic transmission.

Because of the increased power required for added weight and an automatic transmission, the four was replaced by the six.

But the fact remains: Ford did engineer and run prototypes of four-cylinder-powered Falcons.

TOO ROUGH OR JUST TOO SMALL?

At Chevrolet, the same result was reached along somewhat different lines of thinking. According to Ed Cole, the Corvair opposed six has better inherent balance than an opposed four. And, like the Falcon, the Corvair had power requirements for the American market which decision makers felt excluded a four. Not to mention the fact Cole wanted an engine he could tinker with in the upward direction.

Since Chrysler's Valiant was originally conceived as a continental product, a four was no doubt considered first. But the double persuasion of American market tastes and the lure of sharing tooling cost with the new Plymouth and Dart OHV 6 called the turn here.

Don't think that's the end of Detroit fours, though.

Does this early stage development work mean even smaller "small cars" are in the offing from Detroit? It could. The "compact" or "economy" Falcon, Corvair and Valiant fit into a particular market segment, according to both price ($2,000) and customer (the suburbanite). They are not *specificially* competitive with Volkswagen, Renault, Ford Anglia or the cheapest Simca, which cost less, are smaller and do not offer automatic transmission.

WORLD MARKET

But there seems to be a growing indication of a need for U.S.-made cars to compete in this lesser size, power and price classification — not so much in the U.S. market as in the rest of the world.

Detroit executives have been fond of pointing out lately that the world market —Latin America, Africa, Asia and the Common Market area—will comprise a bigger source of sales than the U.S. and Canada within five to ten years. And this is a market which apparently requires much cheaper, smaller and more spartan vehicles than Detroit's newest new cars.

OUT ON THE WELL-KNOWN LIMB

All of this leads us to some current rumors in the mecca of motordom: even smaller cars are in the works. At Ford. At GM. At AMC. And probably at Chrysler. And by this we don't mean the "medium-priced" small cars like the Mercury Comet and the BOP.

Of course, it's entirely possible it's a smoke screen like the Holden bids on the Corvair, but another General Motors division — Pontiac — is putting out blueprints to toolmakers for a four-cylinder block which is described as resembling one bank of a V-8. One answer might be that this is preliminary work being done for one of the GM European subsidiaries. On the other hand . . .

THE SOLUTION TO FRONT DRIVE

Then there's the tale of Ford and front wheel drive. Ford engineers are acknowledged by their colleagues in other companies to have solved most front wheel drive problems.

Ford has run test model front drives on Thunderbirds and early model Falcon prototypes. But the bugaboo all along has been tire wear. With a great deal of weight on the front wheels, front tires are chewed up in no time. And if a rear-engined car has oversteer, a front drive job has understeer — it wants to keep on going straight at a turn. Front gears and steering control have been a problem and front brakes tend to be overloaded.

But one of the main reasons European front drive cars have not experienced the degree of difficulty Detroit has is that their engines are simply lighter, smaller and less powerful. In at least one case, say Detroit engineers, a continental maker equips its cars with different-sized tires front and rear, a practice unacceptable in the U.S.

So the weight problem of a front wheel drive brings us back to four cylinders. By the same token, aluminum rears its shiny head, or rather, block. Such a lightweight power plant would minimize, in the eyes of Dearborn engineers, the worst drawbacks to front wheel drive. (In a parallel situation, Chevy engineers found aluminum was the *sine qua non* of their rear engine car.)

The front wheel drive arrangement in an early Falcon, incidentally, presented an unusual configuration. The block was slanted to one side like the Valiant. The power came out the rear in normal fashion, then went into transfer gears out to the left and then forward beside the block.

Ford, then, has the technology for front drive; the aluminum is readily available from the die casting plant and molten metal contract with Reynolds at Listerhill, Alabama, and suitable four cylinder designs have long undergone tests.

It is unlikely, however, that such a four-cylinder, front drive car would be produced with the North American market mainly in mind.

AMC's VEE ENGINES

Cash-laden American Motors, meanwhile, is a buzzing beehive of engineering activity, including some interest in four cylinder mills. The Austin-built Metropolitan is due for a major change, but whether it will utilize a U.S. or English engine is not known.

AMC has done extensive development work for the Defense Dept. on the V4-powered Mighty Mite. Romney's boys reportedly have made a deal with a major supplier for die-casting of aluminum vee blocks, and it would make more sense to expend this effort on the old four and six cylinder power plants than the relatively new — and unfortunately low-selling — V8s.

(Continued on page 24)

The Austin Healey '3000'

ODDS-ON FAVORITE. The sky's clear, the air's like wine. You're ready for fun, and ready to go. And so is this spirited performer. The Austin Healey '3000' is the fabulous successor to the famous Austin Healey 100-Six which has dominated competition in its class. The '3000' hugs corners, clings to the road with sure-footed assurance. Has speed in reserve for a straight-away 115 m.p.h. Disc brakes bring it to a smooth, straight-line stop. Take this beauty out on the road, and you're really living. For as low as $3051 p.o.e. (2 or 4 seater).

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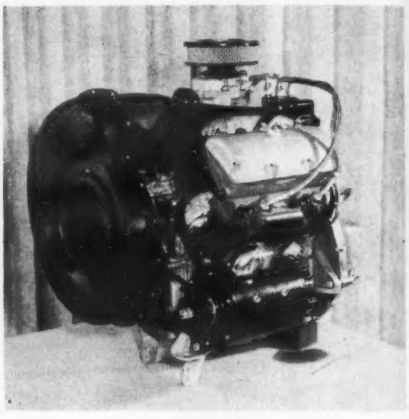
Detroit Newsletter

from page 22

One of the features of the AMC experimental military engines was modular cylinders, which could be made into a variety of configurations: two-four-six- or eight-bangers. It is not unlikely that AMC could offer a new, economical, lightweight power plant in the American series without radically changing the exterior, which is beholden to static styling policy.

So look closely at the silver lining—it may be the anodized aluminum on cylinder liners for a Detroit four.



MIXED BLESSINGS

Getting back to earth again, the shutdowns due to the steel strike probably bode well for the car buyer, for it gave automakers an excellent opportunity to make production, or running, changes in the early 1960 models.

These improvements are particularly important for the new compacts. They are completely new cars from the ground up, with little or no carry-over and more opportunity for error in design or assembly, regardless of the degree of pre-introduction testing.

About 60,000 Corvairs were turned out before GM plants shut down in early November. And you can bet any Corvairs made after that time are better cars—although the originals represent new highs in quality. Among the changes reported on the Corvair were gear linkage, fuel pump, carburetion, emergency brake, seating and some body details.

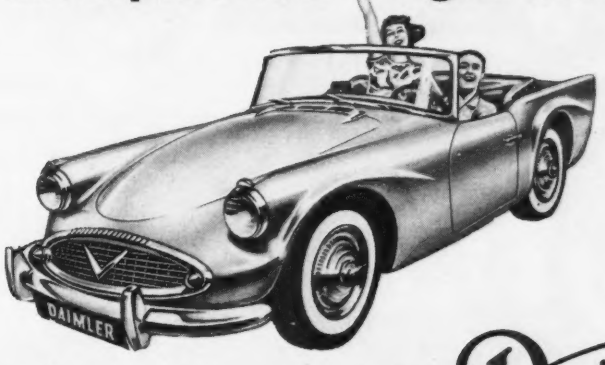
Valiant's early difficulties were obviously in the body-and-trim quality department, although insiders say it is the most nearly perfect all-new car Chrysler has ever produced. Chrysler has suffered considerably from uneven quality ever since it embarked on necessary cost-cutting several years ago (You've heard of feather-bedding?). This year it is working harder than ever to keep up with its competitors in quality. The problem, of course, is determining and then achieving the proper degree of balance between quality and cost.

For the consumer, though, the petering out of most Detroit production was a three-edged blade (Yeah, three. Haven't you ever seen a sword cane?): slow delivery, limited selection and high (undiscounted) prices. For the import dealer, it may have been a blessing... and it certainly puts a longer fuse on the coming sales battle dynamite.

—*md*

PERFECTION

is where you find it...and two of the best examples are right here !



The Daring, Dramatic Daimler

The very appearance of the Daimler asserts its supremacy . . . venturesome, flawless lines . . . complete mastery of road or track thanks to a V-8 140 HP engine that bullets it up to 120 MPH. Accommodating three adults, or two adults and two children, this unique sports car boasts hydraulically operated disc brakes, retractable glass windows and a convertible fabric top. A hard top is also available, as are automatic transmission, overdrive and wire wheels. Here, indeed is a car for the connoisseur!

The Breathtaking BORGWARD

Here is a compact car that seats 6 adults in complete comfort, stretches your gasoline money twice as far. The heavy-gauge steel unitized body affords extra safety, permanent freedom from noise, and there is coil spring suspension on all four wheels with double jointed split rear axle for better all-weather traction. Its 3-to-1 steering ratio and shorter wheelbase give sports car cornering, easy parking. Heater, defroster, directional signals, side mirror, back-up lights are standard equipment . . . though Borgward costs $1000 less than comparable cars!

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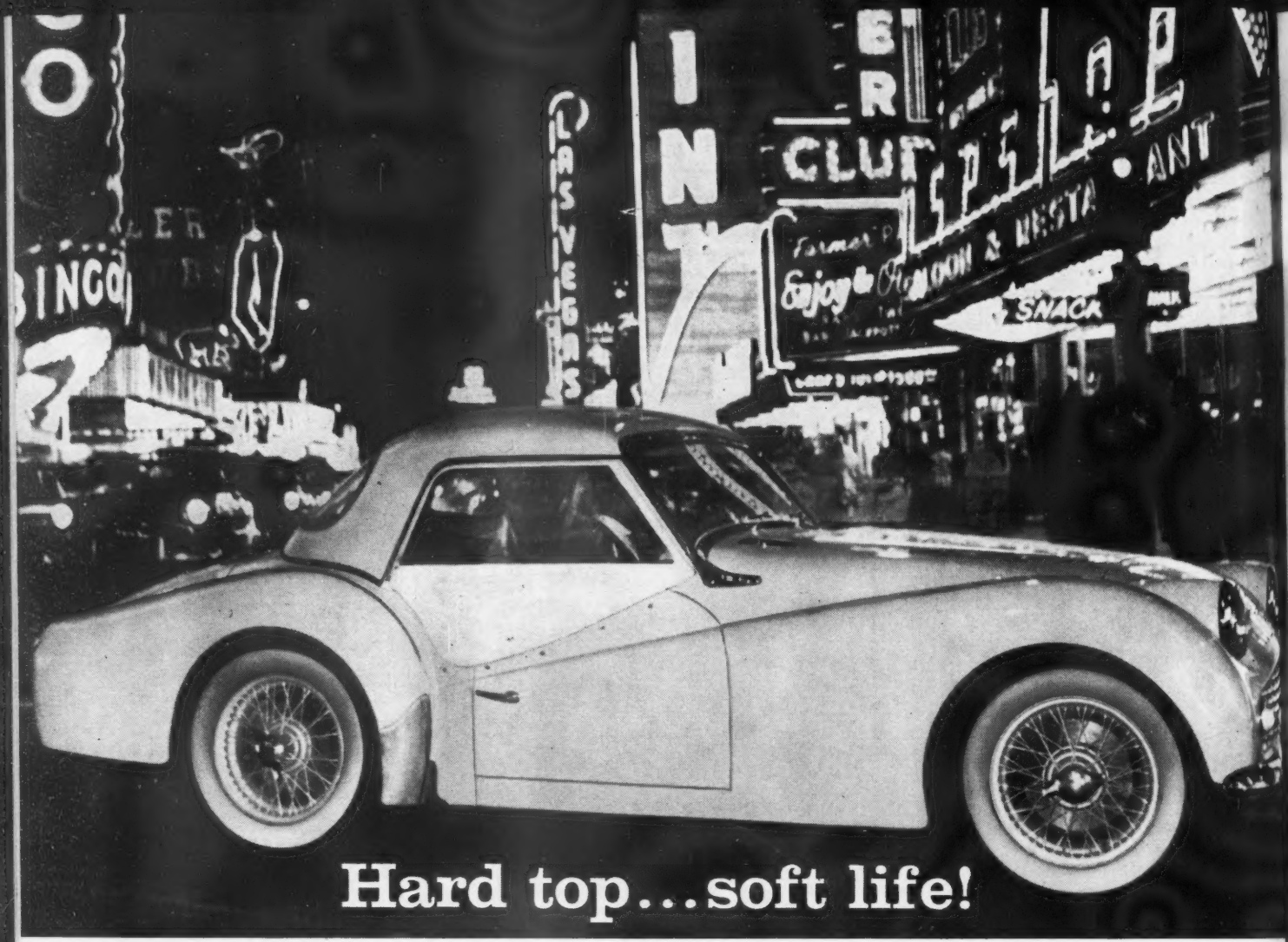


Hard top...soft life!

The living is easy in a Triumph TR-3 Grand Touring Model. (Witness this lucky Las Vegas driver.)

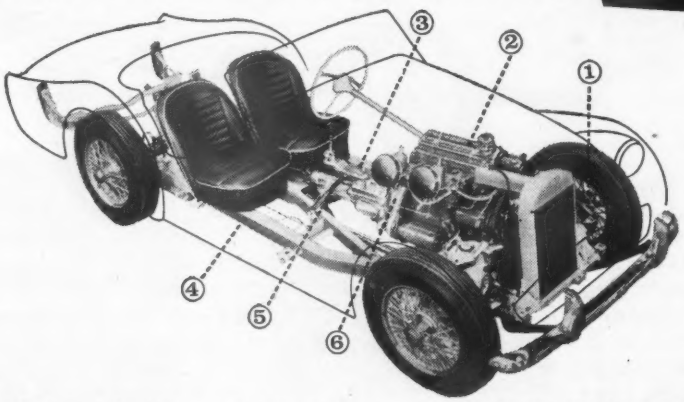
The steel hard top is readily detachable. But so many people like its smart looks and year 'round comfort they just don't take it off. Hard top or not, the TR-3's nimble handling and orthopedically designed seats make you forget the miles and enjoy the fun of driving.

Everything about the Triumph TR-3 Grand Touring Model is "grand" but the price. It costs $500 less than any comparable sports car... gives up to 35 miles per gallon.

The TR-3 has won 1st in class in countless rallies on both sides of the Atlantic. So it's not surprising it's America's number one selling sports car.

The soft life begins at your Triumph dealer. See him today for a test drive!

TRIUMPH TR-3 GRAND TOURING $2835*



6 reasons why the TR-3 is U.S.A.'s #1 sports car buy:

1. *DISC BRAKES:* Standard equipment on front wheels for maximum braking efficiency; will not fade, grab or lock.

2. *1991 cc. ENGINE:* 100 horsepower; top speed: 110 miles per hour; acceleration: 0-50 in 8 seconds.

3. *GEARBOX:* 4-speed; short throw for easy shifting; heavy duty synchromesh in 2nd, 3rd and top offers rugged, smooth operation.

4. *FRAME:* Rigid "X" type for stability; rust-proofed steel.

5. *HAND BRAKE:* Racing type—centrally mounted; has quick release "throw-off" action.

6. *RACING CLUTCH:* Heavy duty woven lining for longer life.

OPTIONAL EXTRAS: Overdrive, soft top kit, rear seat, wire wheels, white walls and others (ask your dealer).

SERVICE: Dealers in every state – over 700 of them in all.

*Convertible model, $2675 (At U.S. Ports of Entry, plus state and/or city taxes—slightly higher West Coast.) Standard-Triumph Motor Company, Inc., Dept. F-20, 1745 Broadway, New York 19

Another decade swivels uneasily into the world's ken, braced by a vibrant business boom . . . including automobiles. Inspired by unprecedented sales success in our country as well as by Common Market competition at home (page 32), car builders overseas have fashioned the fascinating array of new machines seen on the following four pages. Meriting special study are standout sports cars like the Sunbeam Alpine (page 34) and superb sedans of the Fiat 2100 class (page 42). Designed to compete with imports in the marketplace, our own compacts have already met them on the road course as well (page 54). And if any glimpse into the next decade is to be allowed it must not miss the brilliant new power source designed by NSU and co-developed by Curtiss-Wright (page 56). For cars, the next ten years look like the easiest.

SCI REVIEWS 60's FROM EUROPE

FROM FRANCE

Facel

► The only all-new car from France is the Facel-Vega Facellia. In appearance the new car follows the styling theme started by the bigger Chrysler-powered Facel Vegas, the difference being that the Facellia, with its 1600 twin-cam engine, is in the Porsche and Alfa class. Designed from the ground up as a luxury sports-touring car the baby Facel Vega uses an engine expressly developed for it by Harry Weslake, who was also responsible for much of the development work on the C-type Jaguar engine. His latest effort is claimed to produce 115 bhp at 7000 rpm, which is a pretty fair power output for a production-type twin-cam four. At the present writing greater torque, lower down in the rev range, is being sought from this interesting new engine. The Facellia chassis is derived from the bigger Vega series, having independent front suspension along with a one-piece rear axle. Dunlop disc brakes are used on all four wheels, and a Ponte-a-Mousson four-speed gearbox completes the mechanical specifications. A production goal of about 5000 units annually is being aimed at by the Facel management. This firm turns out all the body pressings for the Panhard sedan and the Simca sports, which makes it one of the biggest sheet metal fabricators in France. Thus the Facellia can be thought of as a serious attempt by a large French manufacturer to produce a quality sports car at a reasonable price.

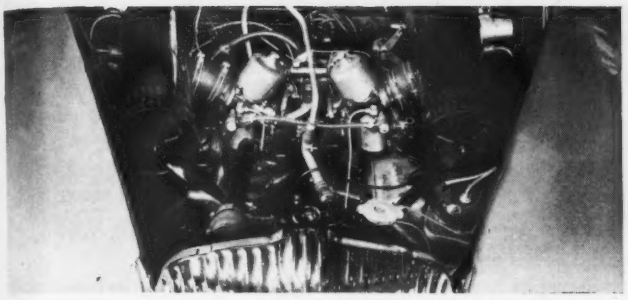
FROM ENGLAND

Austin

► The BMC group have, in the last year or so, redesigned their complete range of cars. All of the sedans have been given very Italian-styled bodies plus suitable interior rearrangement. The Austin A-40 was the first of the BMC family cars to be given the Farina treatment. This was followed by the A-55, the MG Magnette, and the Wolseley. All of these vehicles were powered by engines built up on one of three basic blocks—tagged A, B, and C by company engineers—with various combinations of carburetors, cams and compression ratios. Last of the sedans to receive the Latin touch were the Austin A-99 and Princess. The two new cars share similar mechanical specifications. Both use a 3-liter development of the C series six-cylinder engine, which is also used to power the new Austin-Healey 3000. Lockheed disc brakes are used on the front wheels, with conventional drums at the rear. Total swept area of the new braking system is 300 sq. in.—a high figure for the size of the car involved. A simple device, found also on the BMC mini cars, shares the braking effort between the front and rear brakes up to a rating of 0.4 G. Added pedal pressure is applied wholly to the front wheels, thus preventing the rear wheels from locking during panic stops. An interesting new transmission, utilizing a three speed gearbox with Porsche-type synchronization between each gear, is mated to a Borg Warner overdrive unit. This, in effect, gives the A-99 and Princess a five-speed gearbox. The interior and final body assembly of the Princess series will be handled by Vanden Plas. This old and established coachbuilding firm will also assemble the optional limousine body.

Ford

► Ford of Dagenham's new Anglia model is a completely redesigned automobile. The body style features a rear window with a pronounced wrong-way rake. Even more interesting is the all-new engine, and four-speed gearbox. This last is the first use of four cogs in English Ford's history. The new 997 cc engine produces 41 bhp, and is further distinguished by a very—3.19 in. by 1.90—oversquare bore-stroke arrangement. A brief sampling of the Anglia at Goodwood during the motor journalists' day proved the new four cylinder flexible and noise-free at high revs. The new gearbox and shift linkage also got high marks. It was light to use, yet direct and positive in action.



Daimler

► Daimler has introduced a new engine to be used in their Majestic Major sedan. What makes this power plant interesting is the fact that it has enough muscle to accelerate the weighty Major from zero to 100 mph in 28.9 seconds. To do this a V8 of 4.5-liter capacity is required. It produces 220 bhp at 5500 rpm. Overhead valves are pushrod-operated from a single central camshaft, while two S. U. HD 8 semi-downdraught carburetors handle the chore of supplying fuel/air mixture. Interesting point—the 4.5 is seven inches shorter, 8.5 inches lower, and 28 pounds lighter than the 3.8 liter six that it replaces. What better chart of the progress of engine design?

Jaguar

► Pride of place on the Jaguar 1960 roster is occupied by the new Mark II versions of the 2.4 and 3.4 sedans. Externally the new Mark II's differ only slightly from the older models. Obvious body changes are the increased glass area and thinner pillars. Not so obvious is the increased—4 ft. 2.1 in. to 4 ft. 5.4 in.—rear track, and the repositioning of the exhaust tail pipes. Mechanically much has been changed. The output of the 2.4 engine has been raised from 112 to 120 bhp at 5750 rpm. If a prospective owner feels that he needs more power the standard 3.4, giving 210 bhp, or the 3.8, producing 220 bhp, are available. This last should give really *gran turismo* performance.

To handle all this power better, both front and rear suspension have received detail modifications. The roll center at the front has been raised from ¾ of an inch below ground level to 3¼ above ground. This was achieved by lengthening the lower section of the vertical link carrying the stub axle, and reducing kingpin angle from 7.5 to 4.25 degrees. The Mark II's are also the proud possessors of a completely new instrument panel. The speedometer and rev counter are now placed directly in front of the driver. Other instruments indicate water temperature, oil pressure, generator charging and fuel level. Also included are six toggle switches, button start, ignition lock, and cigarette lighter. All of these instruments are surrounded by polished walnut.

A. C.

► A. C. Cars, Ltd., have received many requests from Aceca coupe owners for a car with a back seat. A. C.'s answer, the Greyhound, seems to take good care of this market. Based on a completely new twin-tube chassis, the Greyhound is larger than the Aceca yet tips the scales at only a few pounds more than its smaller stablemate. Room for the full rear seat necessitated a 10-inch greater length and a more forward placement of the 2-liter Bristol-BMW engine.

The transverse leaf springing system used on the older Ace series has been abandoned in the Greyhound in favor of upper and lower wishbones at the front, and a pivoting triangle—reminiscent of the Chevrolet Corvair—at the rear. This system of four-wheel independence resembles one tried by A. C. on a '58 Le Mans car. All of this engineering sleight of hand reduces wheel camber during spring bump and rebound at the rear, which in turn places the job of steering squarely on the front wheels. The Greyhound is powered by the venerable Bristol-built BMW-derived 2-liter six tuned to give 105 hp at 5000 rpm. Bristol supplies still further stages of tune. The D-type produces 120 hp, while the enlarged—2216 cc—version supplies 130 hp. Naturally, the dollar-per-horespower ratio increases when Greyhounds are purchased with power packs. A. C.'s new four-seater would seem to be a logical progression in performance and design from the well-proven Ace and Aceca models.

Bristol

► Close to the A. C. Greyhound alphabetically and mechanically is Bristol's Zagato-bodied GT coupe. Based on the 406 chassis, the GT uses the hottest version of the Bristol engine. A top of 108 mph is claimed, which represents admirable performance from the car's modest 130 hp. Interior trim and layout are fully up to Bristol standards—which means they are superb. All in all, the Z-bodied Bristol GT coupe is a dream car that can be had for cold, hard cash.

FROM ITALY

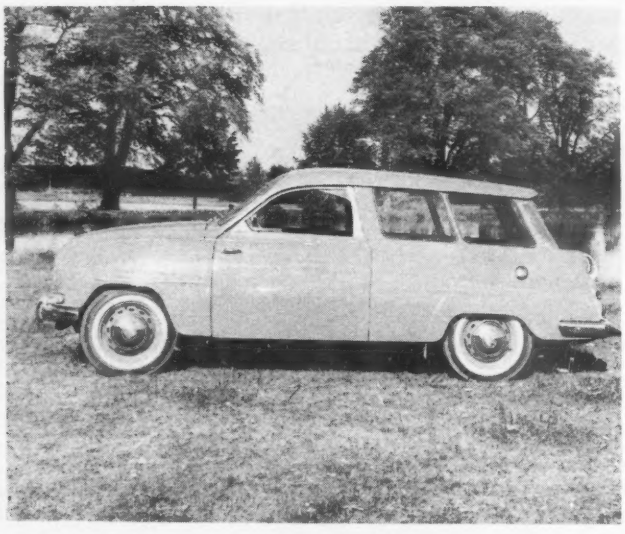
Maserati

► The new Maserati will leave lovers of brute horsepower talking to themselves for many months. Called the 5000 Coupe, it is built around a 340 bhp 5-liter V8. Only four dual-throat Webers are needed to feed this ravening monster. The rather gross body was by Touring, and features, among other things, dual headlights. Maserati fielded this car as a possible rival to the Super America Ferrari coupe. It also provides a receptacle for their sidelined 4.5-liter sports-racing engine, on which the new 5-liter is based.

Abarth

► At the opposite end of the horsepower scale is Carlo Abarth's new 850 coupe, and his still newer model based on the Fiat 2100 six-cylinder power unit. The 850 – in the single-cam version – is quoted at 52 horsepower, while the six produces 135. The bigger cars sport very attractive-looking bodies by Allemano, and should edge Abarth even further into the role of full-fledged automobile manufacturer. A test run in the 850 was more than pleasurable, but again pointed up the fact that production brakes are a bit out of place on Mr. Abarth's pretty, and quick, cars. Development work with English disc brakes scaled down to fit 12- and 13-inch wheels should solve this problem once and for all.

FROM SWEDEN



SAAB

► SAAB's pugnacious-looking fast-backed sedan has been joined by a station wagon, designated the 95, in the Swedish aircraft company's car line. To form the station wagon body the roof line has been brought almost straight back while the body proper ends with a forward-raked door. Two vestigial fins help give the car a longer look. Of technical interest is the use of a four-speed gearbox—the first ever in a SAAB. Also unusual is the rear-facing children's seat, which with the regular seating arrangement borrowed from the sedan, gives a capacity of five adults and two children. With the rear seats folded the 95 can carry over 600 pounds of gear on its plastic-covered steel flooring. Good thought is the top-hinged rear door that opens upward. This is a better arrangement than the side-opening door found on many imports. An interesting point of SAAB's station wagon program is that it will be used to train workers in the aircraft plant in car production. With the shift to missiles for Swedish air defense fewer workers, and less space, will be needed in the aircraft division. The slack will be taken up by building SAAB station wagons. All this would seem to bode well for future wagon owners.

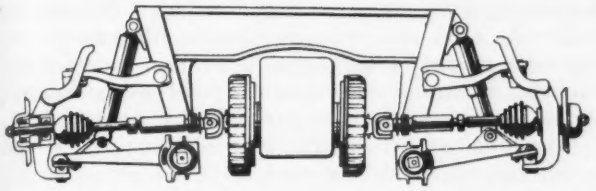
FROM GERMANY

Borgward

► Designed to replace the 2400 Pullman, the new big Borgward has a unit body with front suspension, engine and transmission all mounted on a small sub-frame, which in turn is isolated from the main structure by rubber blocks. To power their latest offering in the luxury car class Borgward has evolved an all-new overhead valve six-cylinder engine. It has the same bore and stroke—75 by 84.5 mm—as the well-tried four-cylinder Isabella unit. The obvious advantage here is that both engines can use the same pistons, connecting rods, etc., thus simplifying production and service problems. All-independent suspension, all-synchro four-speed gearbox, and 100 mph from a smooth 100 hp six make this latest Borgward a good bet for luxury motoring.

Opel

► Designed to fill another segment of the German car market is the long-awaited Opel 1200. It should fill the bill for Europeans who need something bigger than an 1100, but who are not quite able to afford a sedan with a full 1.5 liter engine. Basically the car is a sobersides version of the Rekord model. The powerplant is a smaller version—1196 cc— of the successful OHV 1.5-liter Opel four. With 165 pounds more weight and 10 more horsepower than a Volkswagen, the new Opel's performance is only slightly better than a VW. Where the new Opel should score, however, is in the amount of interior room and the greater flexibility afforded by a bigger engine and fully-synchronized four-speed gearbox.



Auto Union

► The DKW Junior is an outstanding example of the new breed of family car in Europe. First shown in prototype form at the 1957 Frankfurt show with a 600 cc two-cylinder two-stroke, the finalized Jr. has gone into production with a scaled-down version—750 cc—of the larger three-cylinder engine used in the big DKW cars. Four grownups can be carried in fair comfort in this Italian-styled two-door sedan. With 39 SAE horses on tap, the new Jr. is reputed to beat its bigger stablemate away from a stop light. Along with this acceleration a cruising speed in the 70's is claimed. More than adequate performance is one of the hallmarks of the new breed of small cars.

Some of the interesting technical aspects of the DKW include the use of a fully synchronized four-speed gearbox—low-powered cars need a first gear that can be engaged while on the move—and inboard front brakes mounted on either side of the differential housing. The unusual positioning of the brakes on this front-wheel drive car allows the use of bigger drums—they are not restricted by the size of the wheel—which in turn provides better cooling.

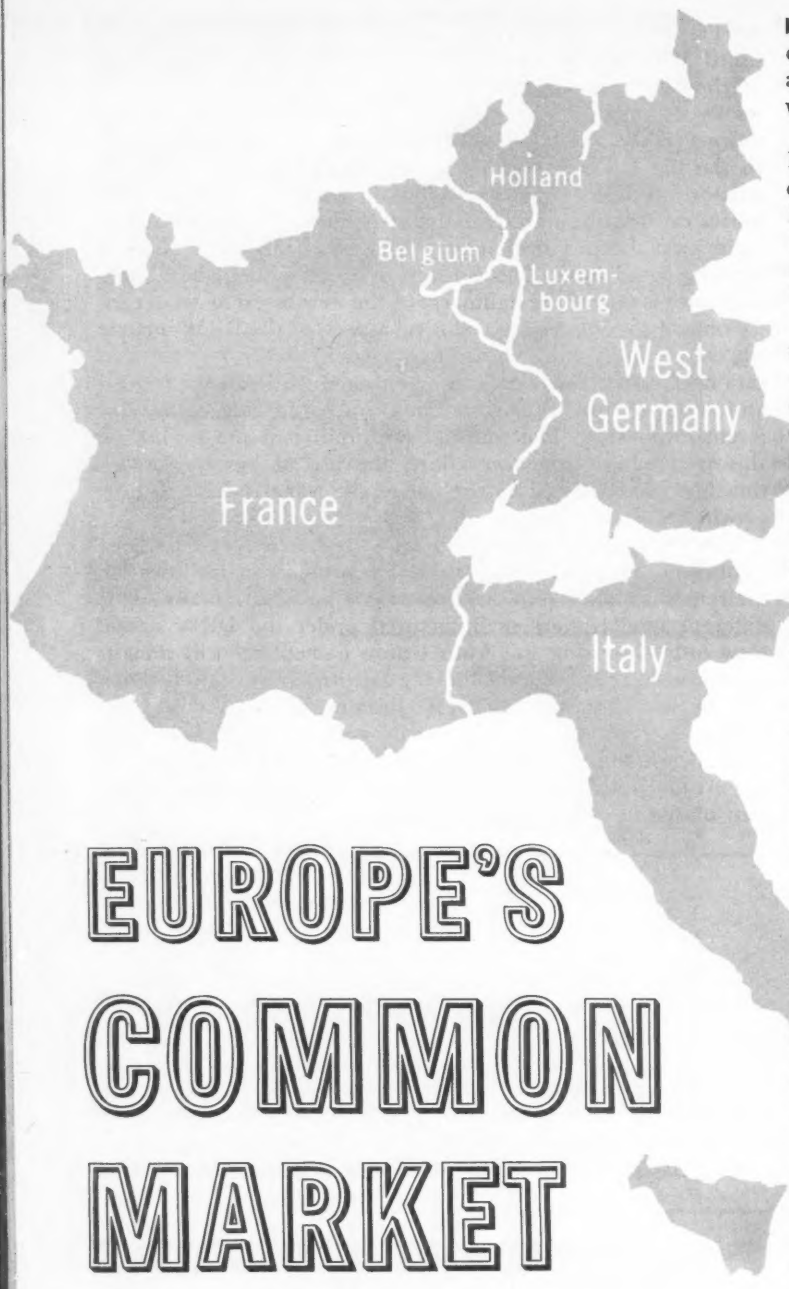
There is no doubt that the Auto Union and Mercedes-Benz combine are going all-out to provide production facilities for their new contender in the low-priced field. Originally eight different models were manufactured under the DKW name. Now only six—using the Auto Union nameplate—will remain in production. The manufacturing facilities freed by this move will be used to produce DKW Juniors. With its new baby selling in the Volkswagen-Renault price bracket, and with equal if not better performance than that of the two old standbys, Auto Union stands a good chance of cutting itself a nice slice of the lucrative small-car market.

Goggomobil

► Hans Glas, the guiding spirit of Goggomobil, is not the man to misread a trend. He accurately read the signs that pointed to abandonment of motor scooters in favor of four-wheeled mini cars by the increasingly prosperous West German populace. With the introduction of his new 700 Isar Sports Coupe he hopes to be in at the beginning of still another shift to faster cars. This little car consists of the body panels of the older T 35 sports coupe plus the mechanical components of the new T 700 sedan. Biggest problem faced by Glas's engineers in this combination of old and new was the front placement of the T 700 engine in a body originally intended for a rear-mounted power plant. A slight lengthening of the nose made more than enough room for the new four-stroke air-cooled twin. Even with the slightly bulbous front the Isar still ranks as one of the better-looking small sport coupes. Any loss of eye appeal is more than compensated for by the gain in performance. The use of twin Solex carburetors, and an increase in compression—from the 7.2 to 1 of the sedan to 9.5 to 1—gives 34 bhp. This—plus the coupe's light weight and good shape—makes a claimed 84 mph top speed easy to believe.

Lloyd

► Another German company attempting ot satisfy the growing demand for fast, inexpensive motoring is Lloyd. The Bremen firm asked Frua to confect a sports coupe based on the engine and running gear of their new Arabella sedan. Luckily, the specifications of these components are such that the resulting car has a useful performance. The water-cooled opposed flat four engine feeds some 38 bhp into the front-wheel-drive half shafts. Front suspension is by unequal upper and lower wishbones controlled by a coil spring and telescopic shock absorber set above the top wishbone. The rear suspension is also independent by virtue of a trailing arm of wishbone formation at each side. The pivot points are angled to help cancel out the inherent understeer of the front-wheel-drive layout. Another bonus feature inherited from the parent sedan are large—eight-inch—ribbed, aluminum brake drums. With good stopping power and adequate go, the Frua-styled Lloyd Arabella should be a strong sales contender in the small-but-quick car field.



EUROPE'S COMMON MARKET

by Robert Gorman

— What Will It Do to Cars? Booming industry and enlarged domestic markets promise more small cars, shrinking variety, and "price-class" competition from giant manufacturing combines.

► Do you cherish a secret longing to drive a really different car? Do you dream that owners of such commonplace vehicles as the Goliath, or Facel Vega, or Pegaso will strip their gears with envy whenever the car of your future rolls into view?

Then take a word of advice and place your order soon. For history—and Europe's new Common Market—are rapidly closing in on uncommon cars. Factories that turn out 30 hand-crafted masterpieces a year may not disappear overnight, but their doom is already sealed as the economic community of West Germany, France, Italy, Belgium, The Netherlands, and Luxembourg moves into its second year.

The fact that the Common Market is at the center of so much current discussion is hardly surprising. But it may be a bit misleading. For the Common Market is as much a result of increasing prosperity in Western Europe as it is a means of achieving it. In the auto industry it is a symbol of far-reaching changes that have already begun and of others still ahead.

The Common Market—otherwise known as the European Economic Community, or EEC—became official with the signing of the Treaty of Rome on March 25, 1957. The treaty aims at reducing restrictions on the movement of goods and people within the six-nation area of Little Europe, and also at establishing a uniform trading policy between Common Market members and the rest of the world.

The three Benelux nations—Belgium, The Netherlands, and Luxembourg—already had a smooth-functioning customs union; all six countries have cooperated (since 1952) in the European Coal and Steel Community. So in some respects the Common Market is only another step on a path that has already been charted.

But it is by far the longest step. It involves—ultimately, though not yet—a larger measure of political integration than any such move in modern European history. And it comes at a time of blooming industrial activity.

This last fact raises a number of tricky questions. Earlier cooperative efforts were generally applauded because they helped war-ravaged nations and industries to get back on their feet. Now they are up and bustling, and traders both in and out of the Common Market are inclined to take a sharper view.

The Treaty of Rome tries to guard against sudden dislocations by providing for a progressive lowering of internal trade barriers over a 12 to 15 year period. The first step—which went into effect January 1, 1959—lowered tariffs between members by 10 percent; at the same time, import quotas were raised slightly and extended uniformly to all members.

Though this modest loosening of trade barriers was heralded long in advance, the fact that the Treaty of Rome went into operation without a serious hitch came as a surprise to many observers. The expectation of trouble was based on much advance grumbling (mostly in French) and some hard realities of trade practices in and out of the Common Market. The Treaty itself is a collection of legal loopholes loosely tted by a blend of hope, vision, and commercial lobbying. Being a device for sharpening competition as well as increasing cooperation, it is liberally sprinkled with escape clauses under which members can continue to protect home industries, maintain profitable trade with non-members, and discriminate against each other in a variety of ways.

This cautious approach was dictated by a number of factors. Differences of language, currency, politics, social customs, industry, wage scales, and national interest aren't likely to be erased overnight; areas in which cooperation would be of mutual benefit are riddled by many pockets of keen rivalry. In the case of automobiles, West Germany, France, and Italy —all major producers—can't have the same interests as the importing Benelux countries. Some of the differences may be narrowed (and others widened) as Belgium and the Netherlands hurry into the manufacturing camp, but tiny Luxembourg shows no signs of becoming a member of the Club.

Not that common industries are any help toward a common trading outlook. The auto industries of West Germany, France, and Italy, in vigorous competition with each other and Great Britain, have different attitudes and traditions about the protection of home industry. West Germany is known for its liberal trade policies. France (until very recently) operated behind a wall of high tariffs and low import quotas. Italy, while slightly freer in some other respects, has gone to great pains to discourage the importation of cars.

Moreover, as the Common Market turns trade inward, it faces some losses in external trade that will affect members in different degrees. Preferences shown to fellow members of a trade bloc are inevitably regarded as discrimination by nonmembers, and often lead to some kind of counter-action. Thus the Common Market has already spurred the formation of a competitive free-trade bloc among Western Europe's "Outer Seven"—Britain, Sweden, Norway, Denmark, Austria, Switzerland and Portugal.

And in the United States, pleas for higher tariffs and other forms of protection or reprisal have grown louder. Demands for reduction in European car imports are among the loudest and most frequently heard.

U.S. reactions—both popular and official—have an even more ominous ring in European circles than in the ears of American sports car fanciers. America is a main source of the loans, aid, and private investment capital, as well as the trade, that Western Europe needs for its continuing growth. But having helped much of the free world toward economic recovery and production for export, the U.S. is beginning to suffer from the competition. We are still the world's largest producer of cars, though by a sharply diminishing margin. (In recession-hobbled 1958, U.S. output of passenger cars totaled 4,240,000; West Europe—including Britain—made over 3,600,000.) But the U.S. now ranks fourth among car exporters (after Germany, Britain, and France) and is being sorely pushed by Italy for even that humble rank.

On the other hand the U.S. has become—by a very wide margin—the world's largest importer of cars. And while this is only one item in a complex of trade, aid, investments, military support, loans, and tourism, it does make a heavy contribution to a steeply rising balance-of-payments deficit. Net dollar outflow has lately been running between $3 and $4 billion a year.

Most free-world statesmen are concerned about the political as well as the economic consequences of this trend. One large fear is that moves toward economic protectionism in the Common Market and Outer Seven may be countered by higher trade barriers in the U.S. and elsewhere. It would then be hard to escape a weakening of political and military alliances. Nor could the possibility of resurgent isolationism be ruled out, though this would be—in the opinion of most diplomats—a disastrous blow to the security of the free world.

Government leaders have therefore been working for a general lowering of trade restrictions—that is, for a widening of market areas and a softening of discriminations against "outsiders." Japan and Britain led off, last November, by announcing a rapid lifting of tariffs and quotas that put U.S. goods under special disadvantages. A few days later the French government announced a similar plan. Meanwhile, negotiators from the Common Market, Outer Seven, and other trade areas are trying to build bridges over which more —rather than fewer—goods will be carried.

Thus early reactions to the EEC seem likely to broaden and modify some of its original intentions. The best hope is that by promoting the prosperity of each of its members it will expand their trade with the rest of the world.

Yet even with a general enlargement of world trade, present signs point to a decrease in the exchange of cars between the United States and Europe. Detroit's new compact models have been designed to recapture part of the market that has recently been lost to imports. Because of the steel strike, the effect of this venture won't be measurable in 1959 sales figures. But there can't be much doubt that America's own "economy" cars will provide serious competition for Europe's.

If Europe doesn't cut back its purchases of American cars, on the other hand, it will be only because there's so little left to cut. U.S.-built cars have been fading steadily from Britain and the continent as much because of their size and cost as because of the trade barriers erected against them. With Europe's own auto industry now reaching almost-American proportions, and with reliable estimates that it will double in the next ten years, exports to Europe face a far from rosy prospect.

To sustain its growth rate West Europe's auto industry must enlarge its foreign markets, and will undoubtedly be able to do so. But it must also find millions of new customers at home. Bigness—in the American sense of high-volume production, distribution, and service—is the order of the day.

Competition in enlarged domestic markets will revolutionize Europe's cars as well as the industry that produces them. For one of the most significant facts about postwar auto manufacturing is that it was shaped by a welter of small companies. Many of these companies were dominated by strong personalities who imposed their strongly individualist views on the products they turned out. Local conditions with which these guiding spirits were most familiar usually influenced their thinking. The result was a tremendous variety of car models with many shared characteristics as well as many others distinctive to their place and maker.

Everywhere in Europe the high price of gasoline has been a factor in keeping the great mass of car engines small. Body sizes have been restricted by the narrowness of roads. But variations in road quality and traffic conditions have prompted varying approaches. Germany's high-speed autobahns, for example, undoubtedly contributed to the selection of gear ratios that make the Volkswagen such a durable full-throttle performer. Britain's smooth but twisty roads, in contrast, put a premium on acceleration and top-gear maneuvering, and consequently on a higher ratio of engine to road speed. The chronic need (or at least the habit) of cornering at high speed on unbanked roads led to the tight springing that American sports car fanciers sometimes have to alibi to critical wives and passengers. The French combination of high-speed national routes and immovable Parisian traffic probably fostered some early developments in 4-speed gearboxes.

Shortages of foreign exchange diluted some local characteristics of European cars while it added some others. Government policy forced even the smallest manufacturers to think in terms of export, particularly to those areas—in Africa, for example—that were least suited to large American cars. Primitive, poorly surfaced, often rutted roads made it useful to give a driver a clear all-around view. This—plus the need to keep transmissions from scraping—gave many cars a tall, squeezed-in look. It also promoted some innovations in four-wheel independent suspension.

Most of the outstanding individuals in European car history (except, perhaps, in Italy) have been engineers. This may have something to do with the general lack of emphasis on styling. It is certainly related to the staggering variety of makes and models and to the large number of basically different engine arrangements. For all practical purposes a buyer of any of America's 20-odd makes of cars has a choice between a V8 engine or a 6-cylinder in-line. Europe offers both of these in addition to V's of 4, 6, and 12 cylinders and various arrangements of in-line or horizontally-opposed engines with 1, 2, 3, and 4 cylinders.

Whatever the engineering merit of such diversity, it takes a toll in manufacturing efficiency that the industry can no longer afford. Specialty manufacturers will feel the effect increasingly as the race for production and market position gathers steam. Outside as well as within the Common Market,

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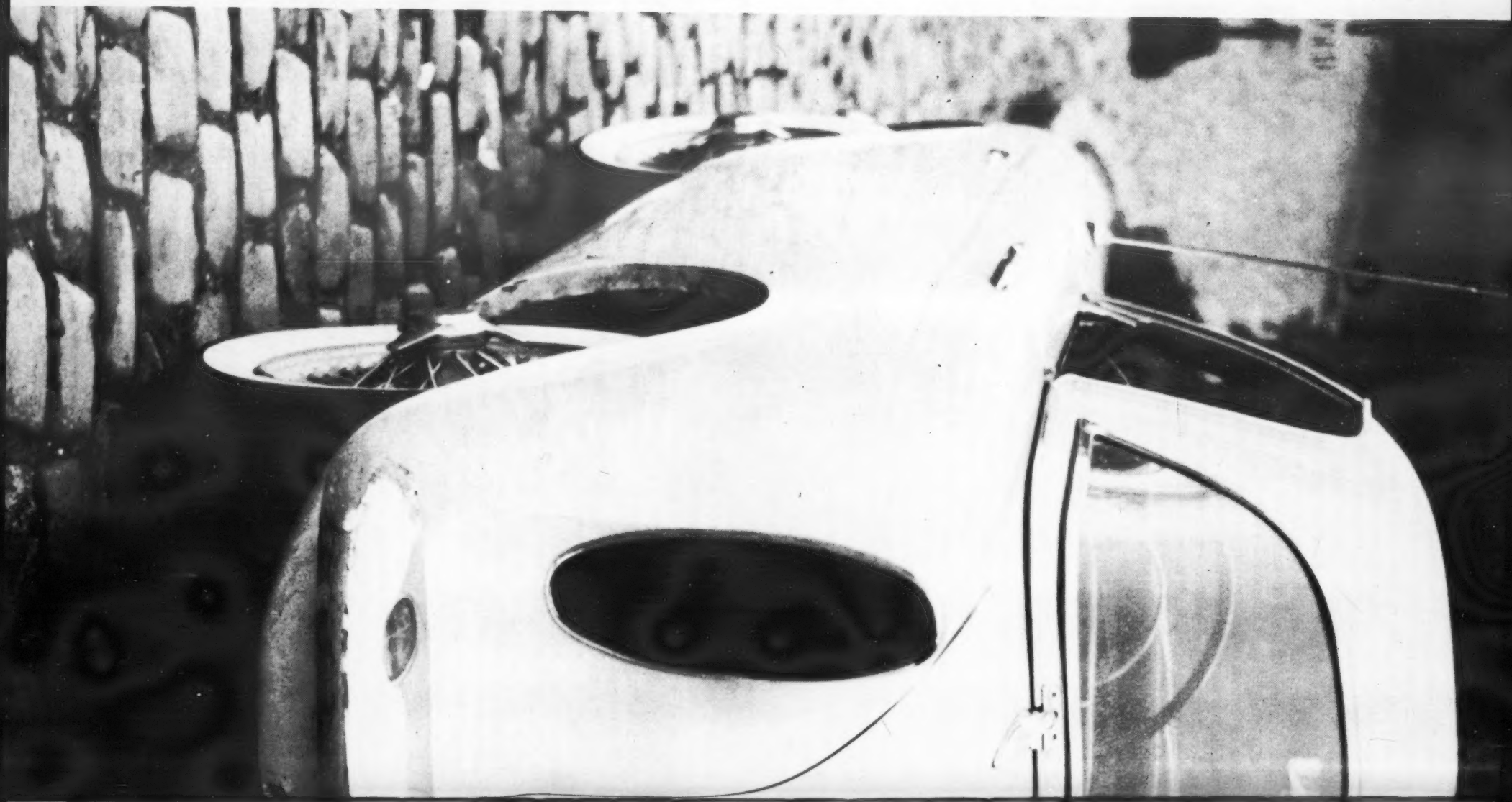


Road Research Report: SUNBEAM ALPINE

With this description and discussion of the Sunbeam Alpine, SCI inaugurates a new way of evaluating automobiles. Reserved for cars which we feel are unusually significant, be it in styling, performance, technical design or just popularity, our critique for potential consumers will be presented in as interesting and meaningful a manner as we can devise. Comments from our readers will, as always, be appreciated. We will continue to discuss other cars of interest in our well-known SCI Road Tests, but from now on major characters in the automotive drama will be introduced and analyzed in SCI's Road Research Reports.

► A new sports car design is always welcome. When it costs less than $3000 and reaches 100 mph, it's especially interesting. The British have long been the most prolific producers of popularly-priced sports cars, so it's no surprise that the Rootes Group has finally entered the scene. To revive the name "Alpine" for this 1500 cc four-cylinder two-seater is perhaps misleading as its heavier 2.6-liter predecessor was much less nimble and quite expensive for its day (1953-55). Yet Sunbeam's long list of rally successes have earned them the right to the title, and if past performance is any guide, the future holds still more laurels for the Alpine.

Like its major competitors (Triumph, MG and Sprite), the Alpine is based on components volume-produced for sedate sedans. The Alpine competes most directly with the MGA, giving away some 100 cc but matching most other specs item for item: four cylinders with pushrods and in-line valves, disc brakes on the front (drums at the rear for "good hand brakes"), four-speed gearbox, wire wheels as an optional extra, coil spring and wishbone front suspension and rigid rear axle with leaf springs.

The curb weight of the Alpine is 180 pounds higher than the MG's, disappointing in view of the unitized construction (borrowing the Husky's floor punt). As a result, acceleration and top speed, at least without O/D, are down a mite by comparison. Against this are the vastly better accommodations within the cockpit, fractionally closer ratios in the gearbox and, very important, be it in the salesroom or out in the rain, windows that wind up and down (2.8 turns) rather than snap on and off.

Basic price for the roadster, POE New York, is $2595, $150 more than for the MG equivalent. Wire wheels are $105 extra, the heater $60 and the tonneau cover $39. Also available on the Sunbeam are the Laycock overdrive ($159) and a light aluminum hardtop ($240). Both seem a shade expensive but the latter compares surprisingly favorably with the MGA hardtop coupe, the extra cost on the Alpine being only seven dollars more for a top that can be removed and left at home.

In keeping with recent Rootes tradition, the styling is mild, miniaturized American. Now that it *is* 1960, the dart or wedge shape has lost its shock value, but in the field of small sports cars it is still novel. The well-cowled and slightly raked radiator grille is a long step forward from BMC's appliqué style, but it still doesn't come across as a real scoop for gulping air. The fender line rises gently but steadily from the hooded headlights past the window sills to the pointed tail lights, stopping abruptly there. The surface is

commendably uncluttered but the overall effect is unfortunately slab-sided. From some angles the car appears long and sleek; from others it doesn't.

Several body seams are welded and filled near the wheel arches and bumpers to avoid breaking the smooth lines desired. And we can hardly praise sufficiently the use of an all-new tail light lens at the fin's trailing edge. (Lucas' monopoly has given British cars a strong family resemblance in this one detail for years and years.) The new lens incorporates a large reflector between the running and stop/turn signal lights. Heaven forbid, though, that all English cars will come to feature this same lens in the future.

The two doors are opened by push button handles on the outside. On our test car, the key was often difficult to insert or withdraw, its sharp-edged notches hanging up on the locks' protective flaps.

The large doors open some 60°, presenting an opening 25 inches wide and 31 tall (with the hardtop). The door posts are sufficiently far forward so that there's ample clearance between them and the seats for large or careless feet without scuffing the upholstery. It varies from 12 to 16½ inches, depending on the seat adjustment. Though the seatbacks are curved noticeably to provide sideways support during fast cornering, they are easy to slip in and out of. For hip support, a central armrest straddles the driveshaft tunnel between the separate seats, while the flat door comes quite close on the outside. No arm rest is fitted but a small hand grip enables the door to be pulled shut easily, the door handle being well forward.

Window cranks are conveniently located but their knobs are on the small side. The glass windows are heavily counterweighted, the left one actually jiggling closed a bit while crossing a stretch of rough pavement. Contrarily, the right one was very difficult to operate.

The rubber seal strip on the windshield post was trimmed a quarter inch too long, so it got pinched and shunted aside when the door was closed and thus provided a very un-clear channel for the rising glass.

Both seats, upholstered in pleated "leather cloth," are adjustable fore and aft over six inches, with six unequally spaced stops. The legroom is excellent, with lots of space for big brogans and long legs. At the pedals there is 20 inches of width, six of them to the left of the clutch pedal. The firewall, in fact, is so distant that the dimmer button is mounted on a bracket which turns out to be a useful footrest to the left of the clutch. The seat cushion is short on support for one's thighs, being close to the floor to give five inches of clearance for the knees under the steering wheel.

Each seat, cushion and all, tips forward for entry to the space behind. Though it is possible to get four adults into the Alpine, two in front and two in back, none will have enough room to be comfortable. The rear "seat-cushion" is contoured for two people facing forward, but even one sitting crossways would find himself hard-pressed for shoulder space (or headroom, if the top is up). Optional cushions to add comfort are more useful for stowing luggage by flattening the surface. Straps and tie-downs would be useful here.

The steering wheel with its comfortable, ⅞-inch thick rim is well-placed for both comfort and control. Although its 16½ inches diameter is smaller than on some English cars, anyone shorter than 5'9" will find it slightly intrudes on their view over the sloping hood. It cannot be lowered, because it is already close to the seat cushion. The horn ring is circular, its top half somewhat obscuring the tach, speedo and oil pressure gauge.

The turn indicator stalk is a little too far from the wheel rim for many, and it self-cancelled only when the wheel was returned well past the straight-ahead position. There are two indicator bulbs on the dash, one for left turns and one for right.

Instrumentation in Sunbeam tradition is sensible though extravagant in detail. All instruments are round with white needles and markings on a black dial. The tachometer, reading to 6000 rpm and redlined at 5800, shares positions of honor with the 120 mph speedometer. The latter has kilometers per hour indicated also. Combined with marks at one mph intervals and both trip and overall mileage recorders, the speedo dial is fussy and confusing.

The water temperature gauge is calibrated in both degrees Fahrenheit and Centigrade while the oil pressure is given in both kilograms per square centimeter and the more usual pounds per square inch. The fuel gauge is only calibrated in gallons, Imperial ones at that.

An ammeter and a clock are optional instruments. Decorative bezels take their place in the meantime. Other dashboard options include cigar lighter, windshield washer and fog light switch. Round pop-outs are already stamped in the dashboard for them, simplifying installation.

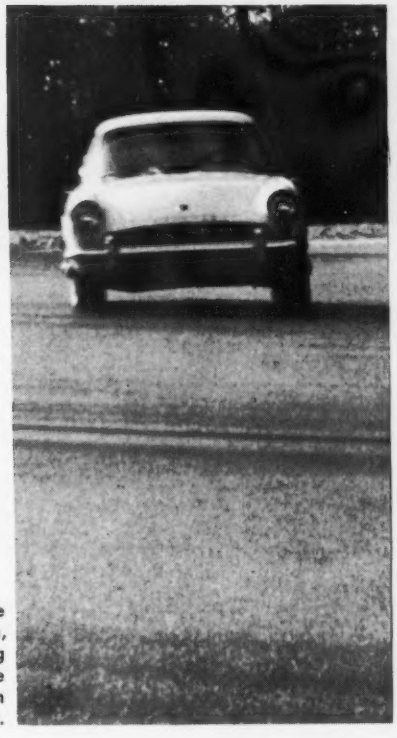
An open cubby hole in the dashboard, about 5 by 5 by 13 inches, can carry maps, gloves, toll tickets or such that might be wanted at a moment's notice, while valuables can be hidden away in the lockable 4 by 4 by 20 inch space under the armrest.

All three switches on the dash are toggle-type of attractive design. The artfully flattened black plastic handles can be flipped with light fingertip pressure. The pair to the right control the headlights and panel lights while the one to the left of the steering column controls the single-speed, self-parking electric windshield wipers. Their arc is unsatisfactorily small, leaving a wide blind spot by the windshield post. Much of this could be eliminated by resetting the wiper arms on their shafts, sacrificing their flush parking position for better visibility in the rain.

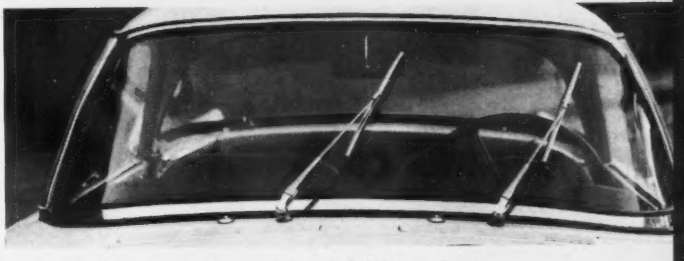
Visibility over the plunging hood is excellent, permitting a 5'10" driver to spot the road surface less than 12 feet beyond the front bumper. The windshield pillers are slim though stylishly curved. It's easier to understand the curved mirror which enables a wide view out the hardtop's large plastic rear window without creating too great an obstruction when looking

(Continued on page 74)

Designed by Kenneth Howes, new Sunbeam Alpine sets fresh standards for British cars with its clean look. The dashboard, below, has neat toggle switches but instruments that are overly detailed. Substantial shift knob is easily grasped; top three speeds are synchronized.

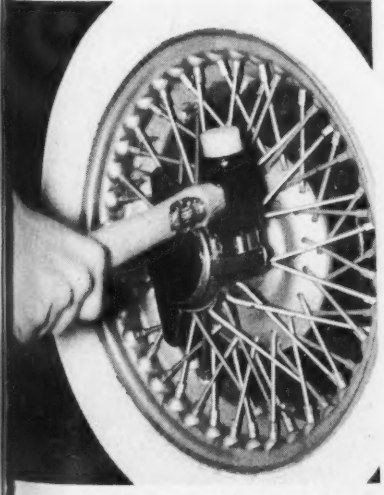


In action around test circle Alpine showed modest lean, marked understeer. Steering feel is sharper, more direct, in corner than on straightaway.



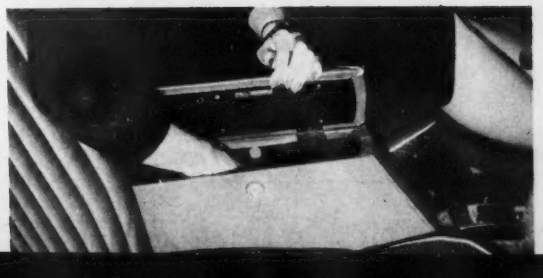
Full swing of windshield wipers to car's left leaves large uncleaned area in driver's corner of wide glass span.

Shown at front and rear adjustment limits, seats are neatly contoured.



Three ears of hub nut are bent inward for pedestrian safety.

The gleaming crystall ball, above, predicts miles per gallon ranging from 19 to 24—good for sports performance.

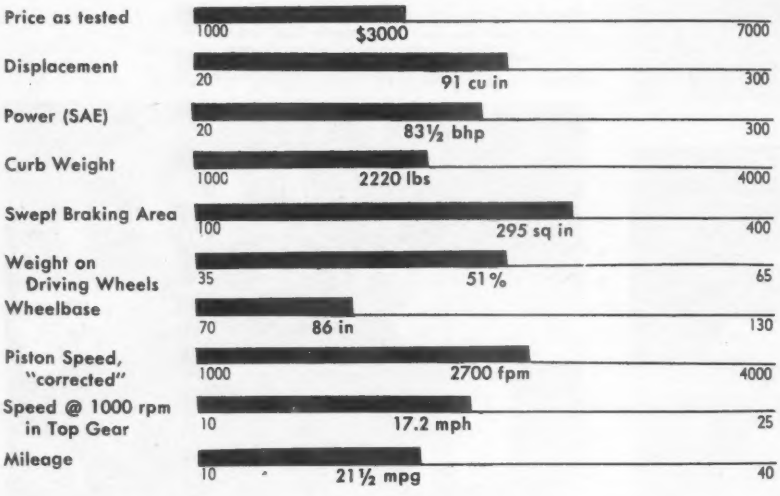


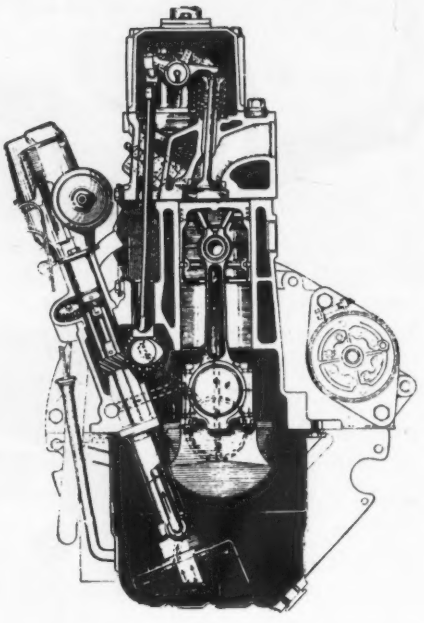
Convenient between the seats is a superb fitting for an open sports car: a lockable compartment for valuables. It braces driver and rider during cornering too.

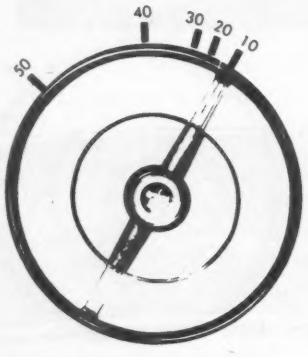
Road Research Report:

SUNBEAM ALPINE

Price as tested: $3000 plus radio
Importer: Rootes Motors, Inc. 505 Park Ave. New York 22, N. Y. or 9830 West Pico Blvd. Los Angeles 35, Calif.

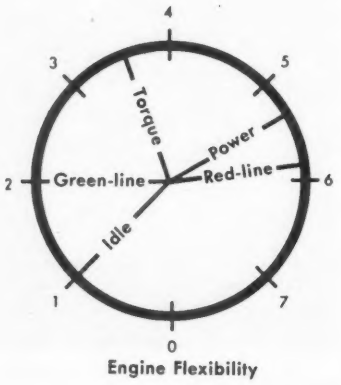




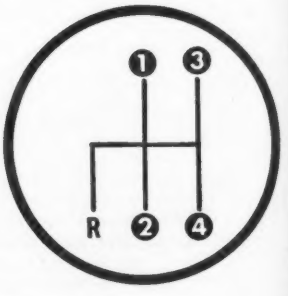


Steering Behavior

Turns to Full Lock



Engine Flexibility



Shift Pattern

ENGINE:

Displacement	91.2 cu in—1494 cc
Dimensions	Four cyl, 3.11 x 3.00 in
Compression Ratio	9.2 to 1
Power (SAE)	83½ bhp @ 5300 rpm
Torque	89½ lbs-ft @ 3600 rpm
Usable rpm Range	2000-5800 rpm
Piston Speed $\div \sqrt{s/b}$ @ rated power	2700 fpm
Fuel Recommended	Premium
Mileage	19-24 mpg
Range	210-260 miles

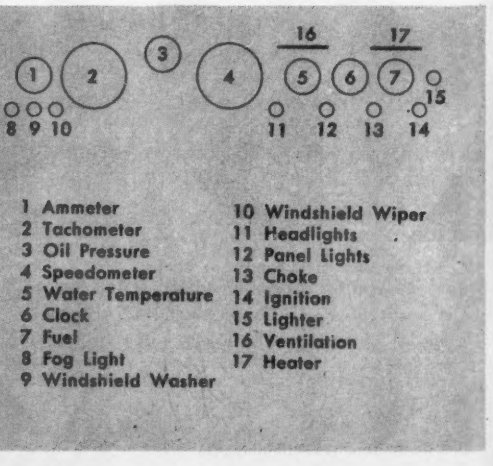
CHASSIS:

Wheelbase	86 in
Tread, F,R	48½, 50½ in
Length	155 in
Suspension: F, ind., wishbones, coils, anti-roll bar. R, rigid axle, leaf springs.	
Turns to Full Lock	1⅘
Tire Size	5.60 x 13
Swept Braking Area F, R	196, 99 sq in
Curb Weight (full tank)	2220 lbs
Test Weight	2520 lbs
Weight on Driving Wheels	51%

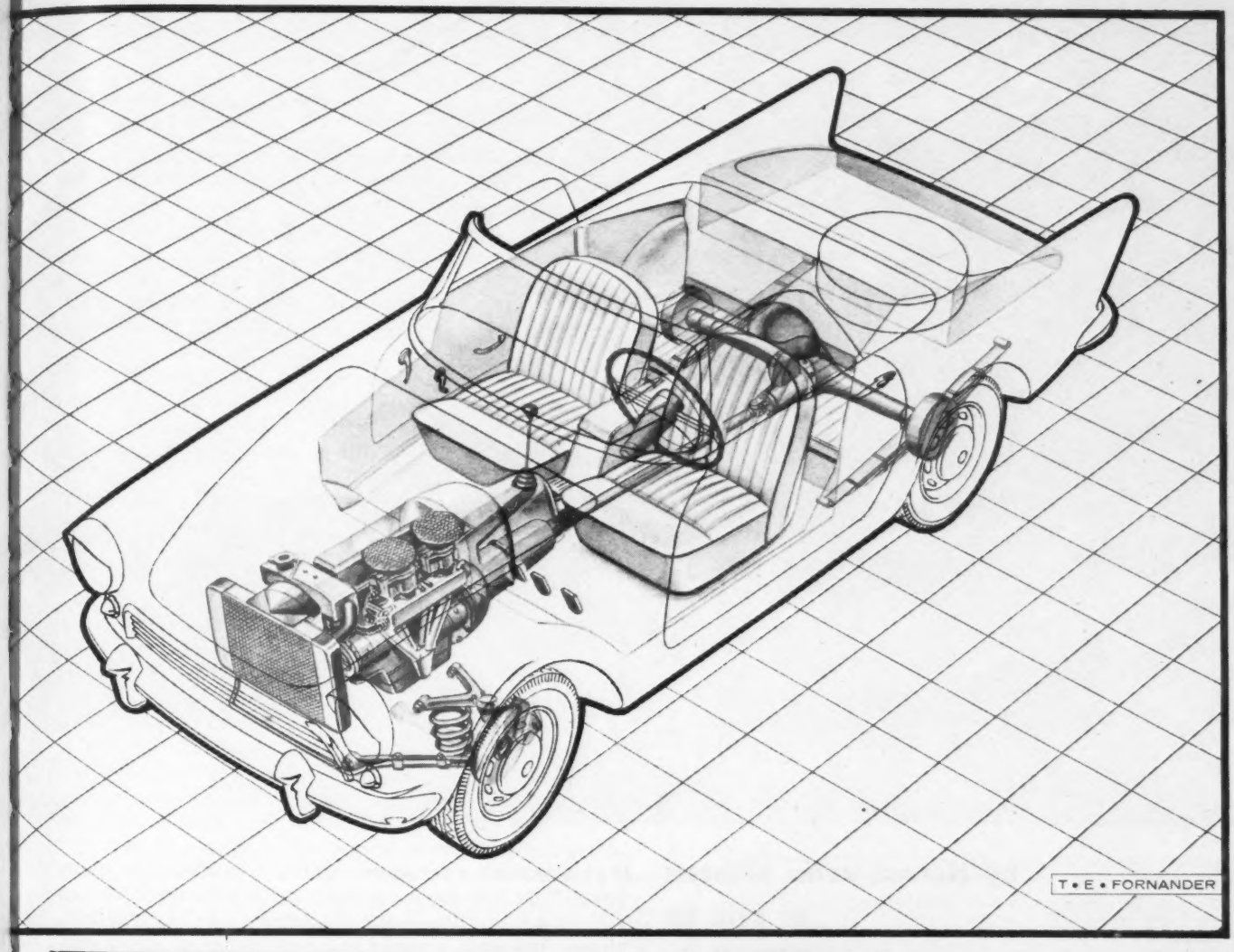
DRIVE TRAIN:

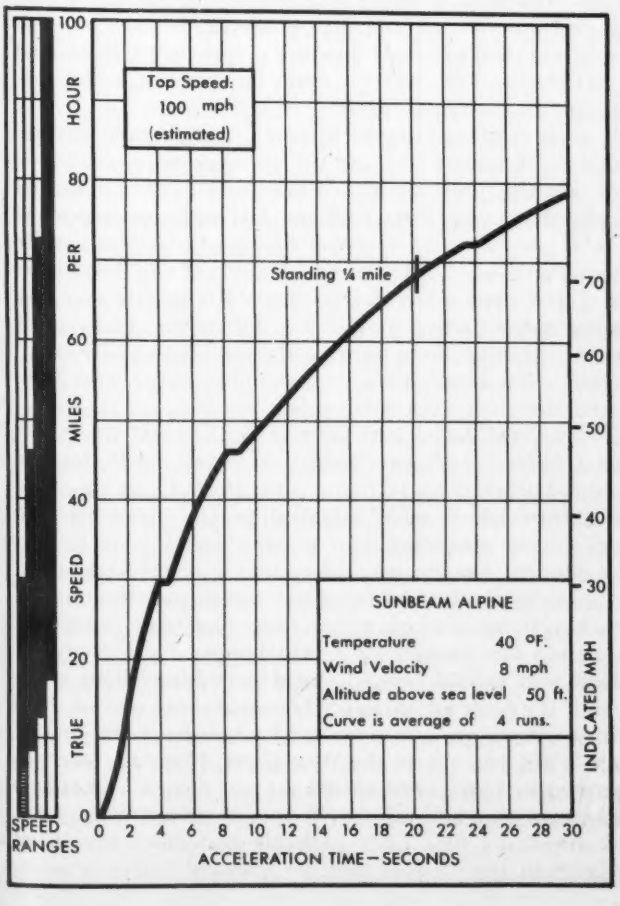
Gear	Ratio	Overall	Mph/1000 rpm
Rev	n/s 4.23	16.49	4.1
1st	n/s 3.34	13.01	5.2
2nd	syn 2.14	8.33	8.0
3rd	syn 1.39	5.41	12.4
4th	syn 1.00	3.89	17.2

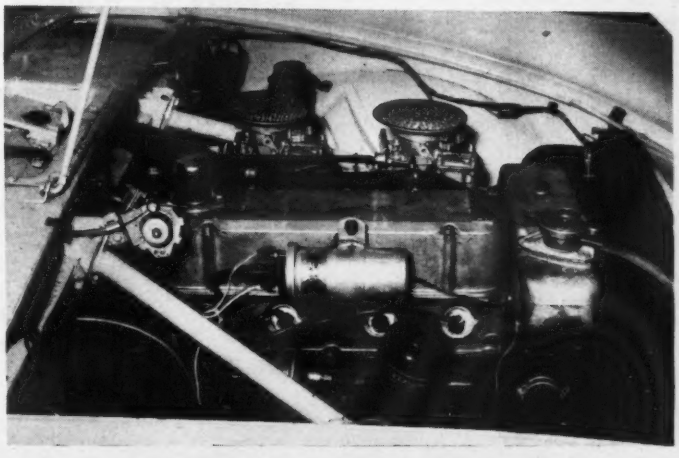
Final Drive Ratios:
3.89 standard, 4.22 with 80% OD.

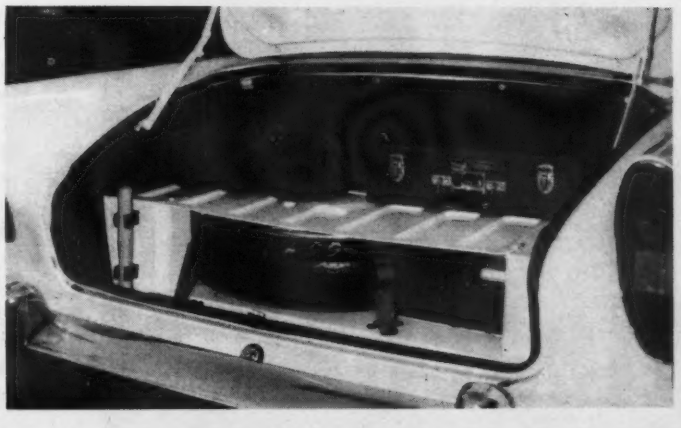


1 Ammeter
2 Tachometer
3 Oil Pressure
4 Speedometer
5 Water Temperature
6 Clock
7 Fuel
8 Fog Light
9 Windshield Washer
10 Windshield Wiper
11 Headlights
12 Panel Lights
13 Choke
14 Ignition
15 Lighter
16 Ventilation
17 Heater


T • E • FORNANDER


Top Speed:
100 mph
(estimated)
Standing ¼ mile
SUNBEAM ALPINE
Temperature 40 °F.
Wind Velocity 8 mph
Altitude above sea level 50 ft.
Curve is average of 4 runs.
SPEED RANGES
TRUE SPEED PER HOUR MILES
INDICATED MPH
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
ACCELERATION TIME—SECONDS





Miseries At Meadowdale

by Honest John Kilborn
as told to
Forrest R. Kyle

► A man with a ravenous appetite to go racing in sports cars will do just about anything to wheedle a seat behind a steering wheel that is directly connected to a pair of wire wheels. And once involved in a weekend of racing, a man will put up with all manner of frustrations to keep this seat. If you don't believe this then focus your bifocals and let old Honest John tell you about the miseries at Meadowdale. It's all the truth, honest.

It takes a strong magnet to lure me away from Indianapolis on Memorial Day, but on the weekend of the "500" there was this professional 303 kilometer sports car race at Meadowdale in suburban Chicago. And there just happened to be a telephone call to Loyal Katskee in Omaha, a week before the race, during which I wondered out loud if he had a spot for a relief driver. The Meadowdale race was Monza style—three heats of 101 kilometers each—so of course there really wasn't any good reason for a driver needing help. But Loyal is six months older than I, and I am six months older than Methuselah, so—

It developed Loyal had bought back his old three-liter Monza Ferrari and was feeding it vitamin pills for the Meadowdale race. Katskee also owns the 4.4-liter six cylinder Ferrari which once belonged to Jim Kimberly and Loyal said he was bringing it to Meadowdale, too. He was kind enough to say he would be glad for me to drive one of them. We'd take turns driving the cars in practice, he said. Whichever one seemed to go best, he'd take, which of course was fair enough for a ride-shopper.

Now you should know a little something about a 4.4 Ferrari. It's quite an animal. There were only four of them built. I owned one and so far as I know it has been junked. There's still one out on the West Coast, I believe. One was destroyed in Italy. Then there's the one owned by Katskee.

The cars were real pigs in the eyes of most drivers. They were unusually big. They probably had more low speed torque than any car ever built by anybody, before or since.

But there were many problems with them. I remember the first time Kimberly had his 4.4 in a race, out in Kansas I think. The block cracked. In another race later the flywheel came loose. This was a chronic ailment and apparently couldn't be remedied by any means except to weld the flywheel to the crankshaft.

This had been done on Katskee's 4.4, incidentally, and it was some consolation during the race at Meadowdale to know it would not be necessary to look down and count my feet due to loss of flywheel.

And with it all the car was a real poor handling auto. It seemed to be tail-light. It was very unstable in the corners. It spun quicker and easier than any car I've ever had any experience with. The few people I know who have driven one agree with me.

Carroll Shelby won the June sprint feature at Elkhart Lake in 1956 in the 4.4, about the only good ride anyone ever had in one of them. And even at that he wasn't happy with the way it behaved.

There is this to be said about the cars. The old buckets go down the straights like nothing you ever saw. When I was in Cuba in 1957, the late Eugenio Castellotti drove my 4.4 until he almost wore it out. He really made it go and appeared to like it in spite of its bad handling chraracteristics.

The trouble with the 4.4 is, by the time you realize it is giving you some little warning, whatever it is warning you about has already happened. It's long gone.

When my 4.4 was sent back to Chinetti's in New York after the Cuban caper, it was found that the frame was cracked. And *then* it was that Luigi told me on the long distance horn the car should be destroyed, that it was no good in the first place. Later I found out that the factory originally did not want to sell the cars to anyone.

But the urge to go racing is great, especially when you're temporarily without a car of your own, so I told Katskee I'd meet him at Meadowdale. I spent the remainder of the week figuring out how I could louse up something on the old 4.4 so he wouldn't like it and I'd get to drive it . . . thinking, of course, that it would go down the chute like gangbusters and I'd worry when the time came about getting it through the corners.

Well, this was the biggest pipe-dream I ever had. It wasn't necessary to do anything to the 4.4 to make Loyal like it less. And it wasn't necessary to improve the Monza any to make him like it more. Everything took care of itself real well and I wound up driving the 4.4 in the most wretched ride I ever had in a race car.

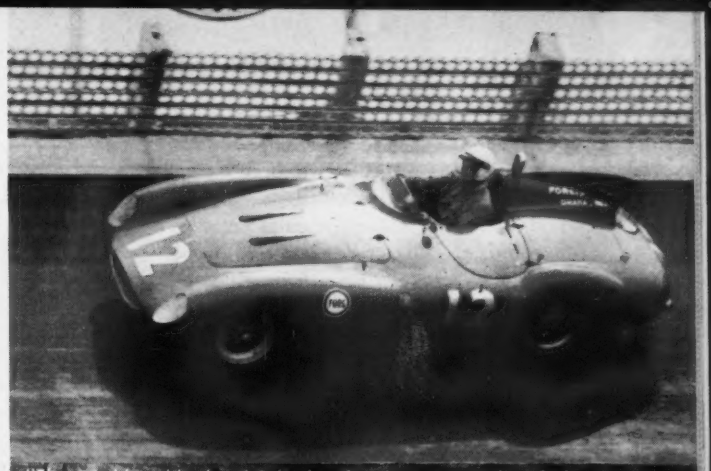
You name it. Everything that could happen to a race car (short of standing it on its nose) or to a driver on a race course happened to this fatigued 4.4 and to Old Honest. I just don't think we missed a thing. It was real bad, then it got worse, then it was ridiculous and it ended up being hopelessly funny.

When I first saw the 4.4 early that Saturday morning I noticed a few cracks in the fenders and a little mismatched paint. In short, the car wasn't sharp looking on the outside, but that didn't count for much. What I cared about was what was under the hood.

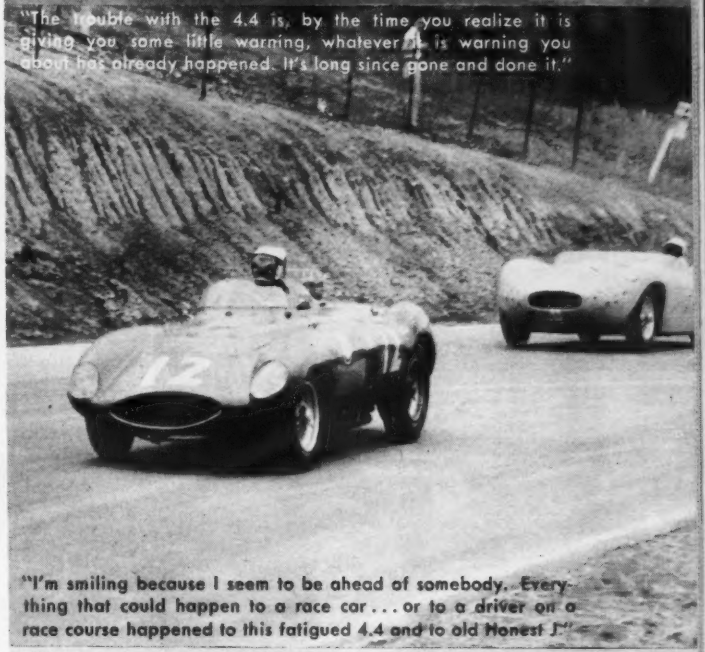
On the first peek I discovered two oil breathers. Before the weekend was over I regretted this. The car threw oil out of one breather and smoke out of the other, so we strictly didn't need two.

I noticed the oil cooler had been removed. This put me in some doubt because in Cuba I had knocked the oil cooler off in a sudden encounter with a belligerent curbing and the old bucket wouldn't run without it. But Les King, Katskee's mechanic, explained that Loyal had been driving this car on dirt tracks and that the cooler, which hangs beneath the regular water radiator, was all clogged with mud

(Continued on page 82)

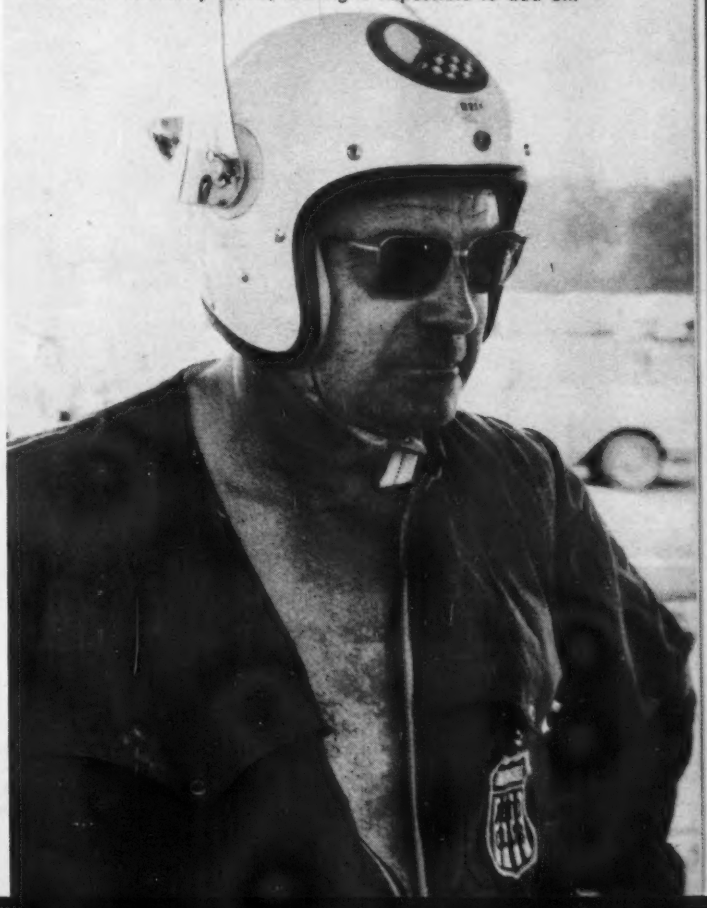


"The trouble with the 4.4 is, by the time you realize it is giving you some little warning, whatever it is warning you about has already happened. It's long since gone and done it."



"I'm smiling because I seem to be ahead of somebody. Everything that could happen to a race car . . . or to a driver on a race course happened to this fatigued 4.4 and to old Honest J."

"During the between-heats inspection of the old beast we noticed a nice big pool of oil under the differential and we found a 2½-inch crack in the diff." "... the filler plug nut was worn absolutely round, making it impossible to add oil."



ROAD TEST:
FIAT 2100

► Elsewhere in this issue of SCI, Bob Gorman delves deep into the intricacies of the common market that has been established in Europe. Viewing it from the economist's angle, Mr. Gorman could reach general conclusions on its likely effects on European cars. Viewing it from the car-owner's standpoint, the automobile road-tested on these four pages indicates that this new arrangement can only benefit consumers on this side of the Atlantic. Fiat's new 2100 is a jewel of a touring car, and the market caused it to happen.

Very pleased with the remarkable sales success of their hardy 600 and 1100 cars in Germany, Fiat decided to go hunting for bigger game – an adversary they hadn't encountered since the war: Mercedes-Benz. In the process they would naturally become competitive with such native products as the Lancia Flaminia and the Alfa Romeo 2000, but this was possibly of lesser importance to the management at Mirafiori.

Fiat's 1400 and 1900 models were in the general size class required, but their four-cylinder engine had neither the power nor the smoothness needed. Their styling was dated and their finish not exceptional. Introduced in 1952 and first produced in '53, a unique 70 degree V8 of two liters was designed for this category. Though one engine was experimentally installed in a 1900 chassis and body (this car is now in the *Museo dell'Automobile* in Turin), the few V8s that were built were virtual toolroom jobs for sports car use.

For the 2100 (and its smaller sister, the 1800) a six-cylinder layout was finally chosen. Fiat is so closely identified with fours that their last six seems a long way back, but in fact a type 2800 six, with 82 x 90 mm dimensions and 5.85 to 1 compression ratio, was in production as recently as 1938 – along with a 1500 cc six. Arriving in 1955, fresh from racing car designing for Ferrari, Aurelio Lampredi was made responsible for the design of the new six. This confidence wasn't misplaced.

Widely publicized throughout Europe as the 1800, which has a bore and stroke of 72 x 73.5 mm, the bigger-bore (5 mm more) 2100 is the only version expected to be made available in this country. Its compact construction, embodying a cast iron block and aluminum head with Lampredi's interpretation of the "polyspherical" combustion chamber, is shown in our cross-section drawing. It's a staunch heart for a new car which can meet its international competition on *all* counts.

Supplied by the progressive Roosevelt Automobile Company in Washington, our sparkling black test car had already covered some 8000 miles on both sides of the Atlantic and was thus nicely loosened up. Since his firm also imports Abarth automobiles, Mr. Roosevelt's 2100 had also acquired one of the good Carlo's experimental exhaust systems during its stay in Turin. The exhaust note is more sporting than stock, as usual, but is not obtrusive outside and is inaudible inside.

An automatic choke supplies instant starting and a fast idle until the water temperature gauge moves off the peg. A hand throttle, under the dash, gives a faster idle if needed or sets a cruising speed. A slight motion, not noise, betrays that the engine's running at its normal idle. Through its

whole range this pushrod engine is exceptionally quiet, humming its way along without any "busy" sounds. Overworked though the simile may be, this engine is turbinelike in its smooth, solid flexibility. So far all signs are that it thrives on hard, fast driving and liberal use of the gears. This was the way we handled it during our test, which yielded an overall gas mileage of nearly 20 miles per gallon. Consumption will probably range between 25 mpg and this figure.

Response to the throttle is quick and consistent, aiding downshifting and precise control. The performance on tap is excellent for the 2100's class and exactly matches the Fiat's general character. The car can be cruised comfortably in the 80-85 bracket with near-silence both inside and out, winds having little effect either on interior noise or directional stability. Useful gear ratios allow better than 50 mph in second and nearly 70 in third—two cogs that are handy for passing in town and country respectively. The red markings on the speedometer are woefully modest; a tachometer would be an asset to this sporting sedan.

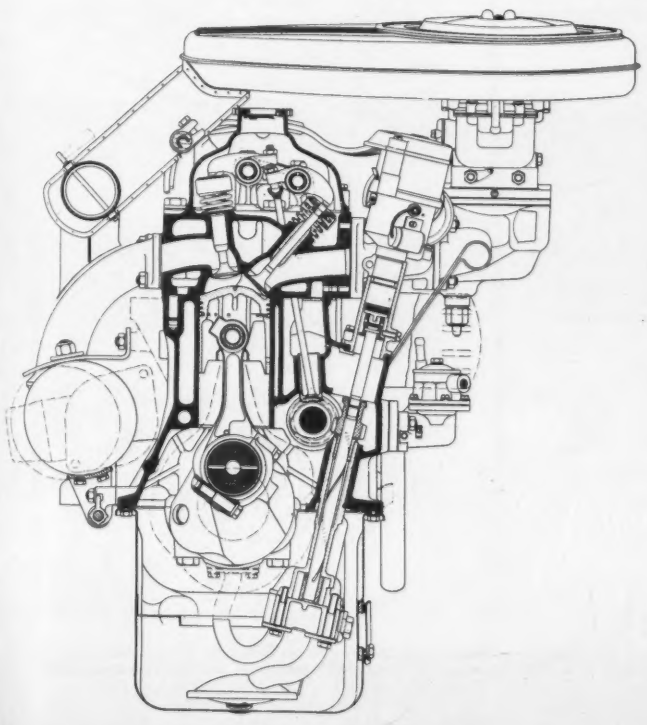
On our oft-demonstrated car the clutch was already tired, not taking hold firmly on full-throttle starts. Its engagement is smooth, its hydraulic actuation moderately easy. Pattern of the neatly-styled column shift is compact but the linkage down below is complex, bringing on a stiff feel in the first-second slot unless specially lubricated. Though low gear is synchronized, it's not encouragingly easy to engage while on the move. This and the linkage stiffness may have been peculiar to this car, but other testers have reported on the latter impression. The reverse gate is on the third-fourth side of the pattern, where it can hang up a fast upshift.

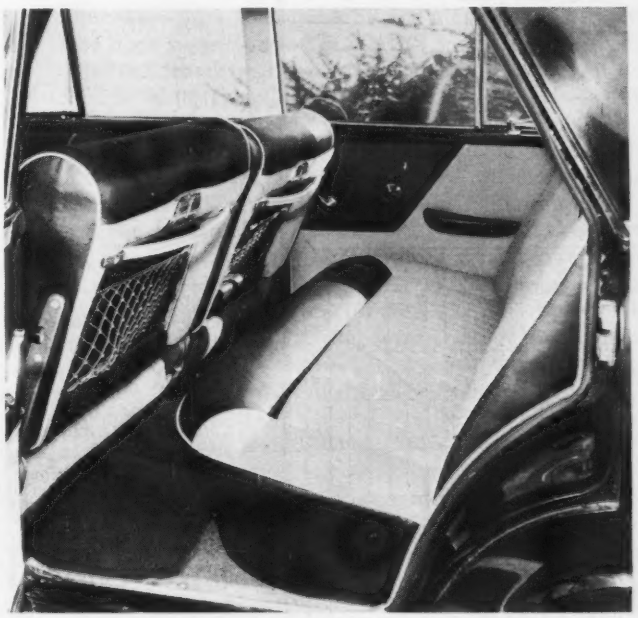
So smooth is the 2100's six that the engine mounts can be firmer than are needed for most fours. This tight control of the engine's torque reaction means that the car's acceleration response has a thoroughbred firmness, without awkward hesitations. Uniquely located by two flexible trailing arms made up of spring leaves, and a Panhard rod, the rear axle's behavior under power is also exemplary. Coming out of a corner and over bumpy surfaces the back tires bite decisively when the tap is turned on. This allows this staid-looking sedan to emerge from corners under full steam in a manner that is as effective as it looks and feels.

Completely without play, the steering nevertheless feels a shade "dead" in the straight-ahead position. Taking into account a moderate initial lean, though, the 2100 responds fast when the wheel is turned. With tire pressures slightly higher at the front than at the back, a definite but far from cumbersome understeer exists. Though it's certainly not difficult to park now, there is a chance that the steering ratio may be changed on later 2100's to provide more but easier turns from lock to lock. We feel that it's just about right as it is on this car. Less suited to fast driving, especially on wet roads, are the Pirelli "Sempione/Nailon" tires fitted in this case.

A high, natural driving position adds to the fun of handling this Fiat. The front bench seat adjusts fore-and-aft as a whole, over a wide range, but its split back can be separately adjusted to different angles by driver and passenger. Well shaped and neatly upholstered, these seats provide the right amount of support in the right places. Vision over the crisp lines of the hood and past the narrow pillars is excellent. Suspended pedals are well placed, that for the brakes having an instant effect when pressed. Use of the patent Baldwin hydro-booster in the front brake circuit gives the easy, light feel of power brakes without their lack of consistency. Though we didn't evaluate it, the fade resistance of the big bimetallic drums should be exceptional.

Deep delight in owning and operating this automobile will be supplied by the many intriguing gadgets with which it's equipped. All, of course, are completely functional. The instrument cluster is designed around a horizontal bar-type





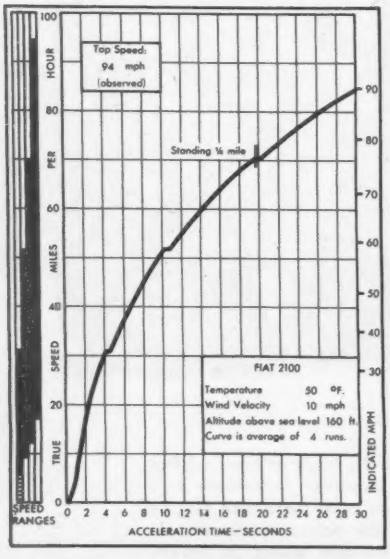
The Lampredi-designed six (left) is the heart of the new Fiat 2100 sedan. Intended to provide luxury-car smoothness with modern performance, the new power plant more than fills the bill. Lampredi's interpretation of the polyspherical combustion chamber owes quite a bit to his past racing car experience. Ash trays, assist straps, net parcel holders, and pleated upholstery all contribute to the aura of functional luxury.

The first six to be produced by Fiat since 1938, the 2100 presents a clean external appearance and noticeably modest dimensions for the 95 bhp produced. Use of a six, with its increased production costs, was accepted by the firm to get smooth power.

ROAD TEST
FIAT 2100

Price as tested: $3192 plus radio

Importer: Fiat Motor Co., Inc.
500 Fifth Avenue
New York 36, N. Y.



ENGINE:

Displacement	125 cu in—2254 cc
Dimensions	Six cyl, 3.03 x 2.89 in
Compression Ratio	8.8 to 1
Power (SAE)	95 bhp @ 5200 rpm
Torque	106 lbs-ft @ 3000 rpm
Usable rpm Range	1000-5800 rpm
Piston Speed $\div \sqrt{s/b}$ @ rated power	2560 fpm
Fuel Recommended	Premium
Mileage	19-23 mpg
Range	210-250 miles

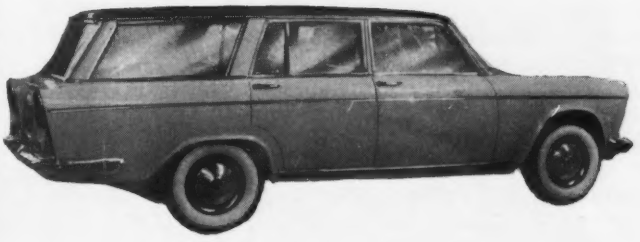
CHASSIS:

Wheelbase	104 in
Tread, F,R	52¾, 51½ in
Length	176 in
Suspension: F, wishbones, torsion and anti-roll bar. R, rigid axle, coils, ¼-leaves.	
Turns to Full Lock	1⅝
Tire Size	5.90 x 14
Swept Braking Area F, R	171, 131 sq in
Curb Weight (full tank)	2810 lbs
Test Weight	3140 lbs
Weight on Driving Wheels	46½ %

DRIVE TRAIN:

Gear — Ratio	Overall	Mph/1000 rpm
Rev n/s 3.22	13.82	5.4
1st syn 3.22	13.82	5.4
2nd syn 1.90	8.17	8.9
3rd syn 1.40	6.04	12.1
4th syn 1.00	4.30	16.9

Final Drive Ratios: 4.30, no others available.



Station wagon model will also be available on the 2100 chassis. Crisp, straight-lined Italian styling fits wagon theme very well.

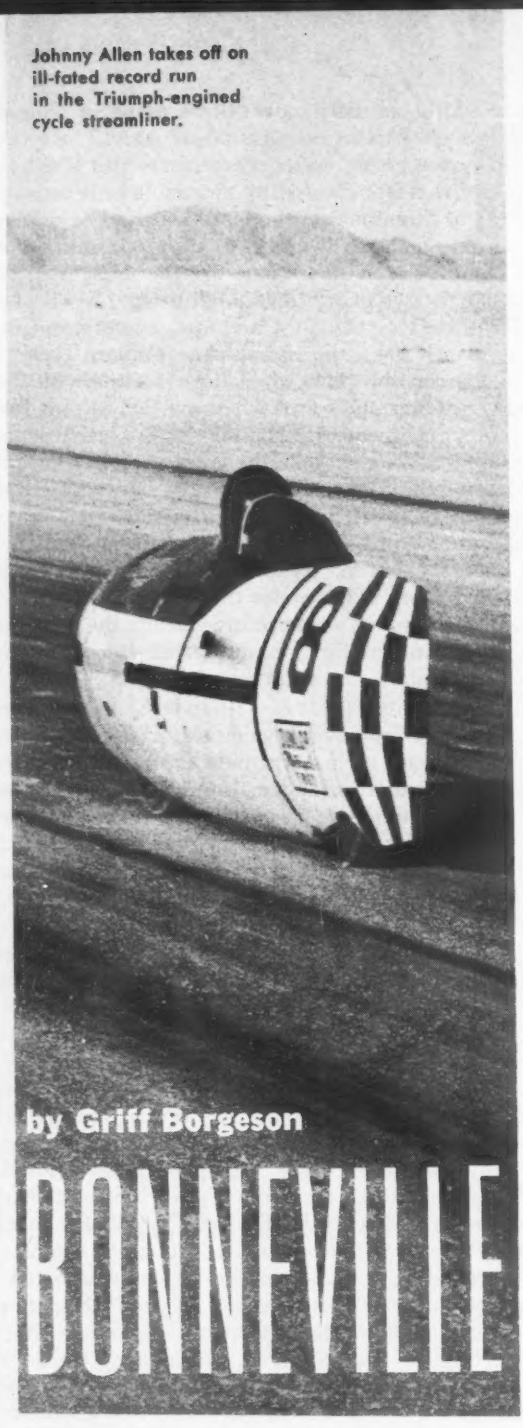
Angular lines of the 2100 sedan lend themselves to providing a good-sized trunk. Front bench seat provides good lateral support.

speedometer which actually moves horizontally in a meaningful way, though without exceptional accuracy. The speedomter and the oil pressure, water temperature and fuel level gauges are very well illuminated by a variable-brilliance system. Speaking of illumination, there are a myriad of colored lights ensconced on the 2100's dash to supply instant information on the car's activities. There are the usual ones for directional signals (self-cancelling), high beam, low oil pressure (though there's a gauge too) and low generator output. A red light flashes when the handbrake (pull-out type) is applied, and a green one glows when any of the main outside lights are on. Another one warns when the fuel level is low, while yet another is lit when the special blower for defrosting the rear window is switched on. The euphemistically-named courtesy light for the front seat is mounted behind the rear view mirror, where it can be switched on separately or by opening of either front door. Two more such lights are integrated with anchors for the assist straps above the rear doors. There are more lights under the hood and trunk lid, and as a guide to cyclists on its native heath the Fiat has additional direction-signalling lamps faired into the side chrome strips just above the front wheel cutouts.

A major breakthrough in design in Italy has been made by heater manufacturers—or so it seems when comparing the 2100's installation with earlier Turinese efforts. A very elaborate heating and ventilation system, simply and quickly controlled, is fitted as standard. Its prodigious output can be quickly directed to the floor or windshield area, as required. Just above the under-dash heater console is an ashtray that pops open at a touch of a button, somehow without dumping its contents on your hand. The latch of the glove compartment has a similar effect, exposing a wide but shallow storage volume and revealing the T-handle control that opens the hood.

Hinged at the front, the sound-insulated hood opens to expose a wide engine compartment offering excellent accessibility around the narrow six. Oil filter, dip stick, distributor, spark plugs—all are right up where they can be found and attended to without even getting dirty. The finest impression, though, is made when the hood is dropped gently closed. There's a firm "ker-chunk" that's more solid in sound than the door latches on most cars. It's achieved by using a novel rotary latch. The doors? They open to about 80 degrees, giving unobstructed ingress, and close in an almost unbelievable manner. Not only is it unnecessary to slam them; they practically close themselves! Rotary latches of the new Wilmot-Breeden (English) type are used, which clamp the door shut with the merest wisp of pressure. The impression of excellent quality given by this feature isn't belied by the finish on the rest of the 2100. All the seat and interior trim is carried out with care in keeping with the hoped-for prestige status of this car. Unfortunately the dashboard, like the exterior paint, suffers from severe orange-peel, and the attachments of the door pockets were showing signs of giving up the fight, but overall the effect is one of precision in design and assembly.

Also to be available when deliveries begin in early 1960 is a handsome station wagon, whose necessarily squarish lines harmonize well with the basic razor-edge theme of the sedan. Fiat themselves did the 2100 styling, by the way, only checking with Farina after it was finished "to see if it was all right." Prices at the Baltimore port of entry are $3192 for the 2100 sedan and $3498 for the station wagon, figures which we feel offer unusual value. In general quality, solidity and smoothness—sheer pleasure of driving—this new sedan is the peer of many of its European contemporaries costing as much as $3000 more. Its ability to cope with the Mercedes reputation overseas and the new compacts here is yet to be tested, but on the latter count we can assure you that the extra $900 or so is well-spent on sparkling performance and heart-warming stability and construction. The common market has bred a winner this time.



Johnny Allen takes off on ill-fated record run in the Triumph-engined cycle streamliner.

by Griff Borgeson

BONNEVILLE POSTSCRIPT

British machines meet with mixed success at season's end.

► This year's BMC record runs on the Salt were interrupted by the same meteorological inclemency that sorely frustrated the Mickey Thompson LSR attempt. Stirling Moss arrived on the Salt in mid-September to try to propel the superb MG streamliner to a series of new Class E records. After making the best of a hopeless situation for several days in Las Vegas he returned to England to keep other commitments.

Capt. George Eyston remained on the Salt with the car; Phil Hill waited in Santa Monica for the call to drive it, as he had done two years before, as Moss's stand-in. Finally Hill was summoned and joined Eyston and jovial Alec Hounslow (This was Nuvolari, SCI, June '57) on the Salt on Oct. 5. The car was as tiny and beautiful as when first seen in '57 but appeared even cleaner without the apparently superfluous stabilizing fin it had previously worn.

It was a cloudless day but the Salt was still greasy. Hill relaxed in a touring car, chatting with passers-by, as Capt. Eyston kept an eagle eye on preparation of the car. Over the USAC phone came the word, "Course clear, clocks checked; you may start when ready."

In went the fuel and the atmosphere was drenched with the shoe polish smell of 86 per cent methanol laced with nitrobenzene, acetone and sulfuric ether. "The blend was good enough for the Mercs in the Thirties," said Hounslow, "and there's still nothing like it for cooling the valves and for all-'round flexibility." He fired up the engine, drove the car around the warmup area, and delivered it to Hill.

The driver buckled on his crash helmet observing, "I don't believe in safety harness for open cars but I think that this machine could use it," then slipped into the cockpit and was away.

This was to be merely a trial run, to test the engine's tune. Hill blasted off and the Shorrock-blown twin-cam engine blubbered and blooped. But he went so well that an immediate return run was agreed upon. He came back, still shooting ducks but still going fast. What was intended to be a mere shakedown run insisted upon being a full set of new international records for Class E (1500-2000 cc), subject to FIA confirmation:

Distance	New Record
1 km	254.91
1 mi	254.57
5 km	232.97
5 mi	238.36
10 km	234.49
10 mi	191.03

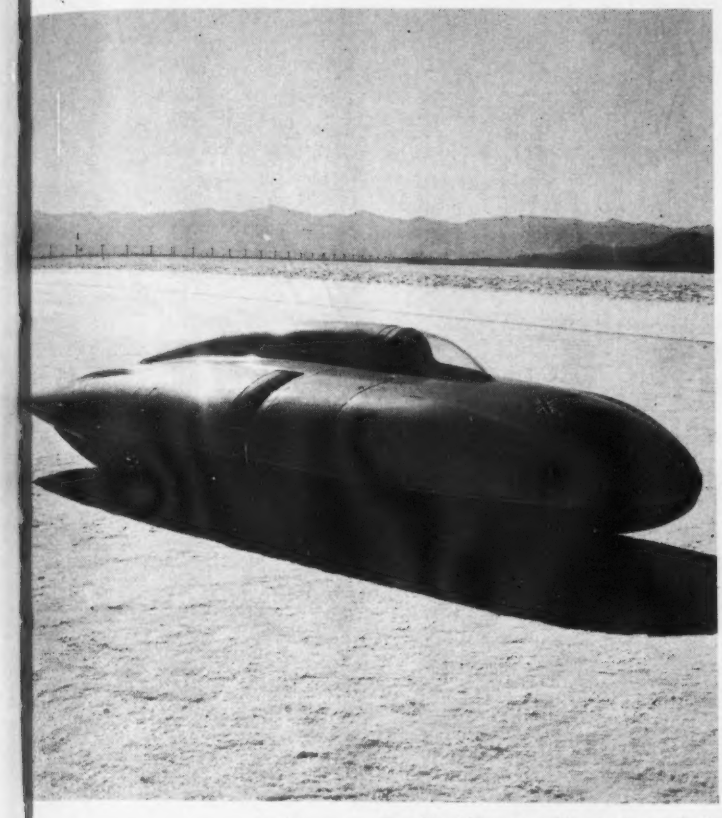
As Hill shucked off his Dunlop jumper I said to Capt. Eyston, "If you ever get that engine running you'll have a fast car."

"Oh, yes," he said. "We expect it to do a good 270 but it's wise to make haste slowly."

JOHNNY ALLEN AND THE TEXAS TRIUMPH

Stormy Mangham's masterpiece, the two-wheeled streamliner that holds the World's Record (SCI, January '57) with an unsupercharged 650 cc Triumph engine, returned to the Salt to improve upon its two-way record of 214.47 mph set last year by Johnny Allen's standby, fellow Texan Jess Thomas. The crew of Allen, Thomas, Pete Dalio and Bus Schaller suffered the weather-imposed frustrations that plagued all comers following the serene Bonneville Nationals. They journeyed to the Salt, witnessed its inundation by rain, returned to Fort Worth, came to the Salt again during early October's moment of dryness.

The bike had been ready for weeks so when USAC gave the nod, Allen borrowed Mickey Thompson's Snell Foundation-approved helmet and insinuated himself into the tiny shell. His buddies pushed him off and he went down the long black line and through the gears with his cast-iron-block



This year the EX 181 ran without the tail fin used in 1957. Ultimate speed aimed at with MG-based engine mounted in this chassis is 270 mph.

Phil Hill tries on the EX 181 for size. Lack of roll bar and safety harness would bar car from most American-run speed trials on the salt.

Two record-run veterans, Alec Hounslow (left) and straw-hatted Capt. G. E. T. Eyston talk to their driver Phil Hill.

engine firing clean and clear. He was taching 7000 at about 200 mph and just ready to grab fourth when his rear wheel locked up tight. Allen naturally assumed that his engine had seized, fought the steering and released the clutch. No help; the bike continued in its locked-up forward slide. Allen held it steady for nearly half a mile, then could hold it no more. It got sideways, made an end-over-end flip, soared in the air for 75 feet then went bouncing and sliding in all directions. In this vehicle the rider's head is not enclosed and Allen tapped his several times but received no head injury.

The crew rushed to where Allen had come to rest. He had already dragged himself from the debris and greeted them with a slowly-drawled, "Aw, to hell with this. Let's go fishin'."

This is what happened. The record machine needed a new parachute brake and one was ordered by mail at the last minute. It was a bit too large for its receptacle, from which some small festoons protruded. At 200 mph they were sucked into the chain and rear wheel, followed instantaneously by the total 'chute. Naturally, things locked up.

It is well worth noting that the Dunlop tire on the locked wheel was ground down to the fabric but no more. The cord resisted the tremendous abrasion it received.

Allen was rushed to the Tooele County Hospital, 80 miles away, where he was examined and treated. Miraculously, he had emerged with just a cracked rib and various stretched ligaments.

Four hours later Capt. Eyston and I were comparing notes in the motel courtyard when, out of nowhere, Allen materialized, just back from the hospital. He leaned against a post and went green under his deep tan. We swarmed around him and, holding him up by the armpits, steered him across the yard to his bed.

As we passed the bike on its trailer Allen asked, "Is it badly bent?"

"No," we told him, "the frame is just tweaked a little. Only the tail of the shell was ruined."

On the verge of passing out he said, "Well, why aren't they working on it then? A little fiberglass is all they need. I came here to *ride* that thing."

We tucked Johnny between the sheets but before he slept he said, "I feel a lot better about that machine now. I flipped it many times when I was learning to ride it, but always at speeds less than 50 mph. I figured that if I ever lost it at high speed everything would scatter. Now I know how well Stormy built it; I'm still here."

Stormy Mangham's plane was grounded by weather in far-off New Mexico. Schaller broke the news to him by phone and Stormy directed, "Pick up the pieces and bring them back home." The tiny two-wheeler will run again after proper repairs are made. Meanwhile, Stormy is hard at work on a new project: a 400 mph two-wheeler to be powered by a Chevrolet V8 engine!

As for the legal dispute between the British Manufacturers Association and the continentally dominated *Federation Internationale Motorcycliste*, few persons west of the English Channel seem to be deeply concerned. The Triumph streamliner is the world's fastest 'cycle, according to clocks and authorities that are acceptable to the FIA, but not the FIM. Lamentably, that argument seems to be a political and academic one, without much reference to legitimately-accomplished record speeds.

—gb

by Karl Ludvigsen

SCI Technical Report:

New Iron In The Fire

As here at Zandvoort, Aston test driver Roy Salvadori found the new Grand Prix car beautiful to handle but lacking in power for its weight.

► At the conclusion of a discussion of Aston Martin's DBR1/300 sports car, back in December, 1957, SCI said, "You may note how suitable the DBR1 suspension parts and gearbox would be to a G.P. car, and also the next year's Formula is for 2½ liter cars on gas, with which John Wyer's crew have plenty of experience. That heavy engine block was always an obstacle, but now that it's been given a diet . . . It's all up to David Brown, of course, but at this rate he'll soon have a new world to conquer!" 1958 was not to be the year, but 1959 saw simultaneously the utter dominance of the well-developed DBR1 in sports car racing and the first trial season of the long-awaited Aston Grand Prix car: the DBR4/250. (This designation, by the way, indicates David Brown Racing car, basic chassis-engine combination #4, displacement approximately 2500 cc. DBR2/370 was the big combination of Lagonda chassis and G.T. engine now being raced by George Constantine,

Unlike its sports car heritage, Aston Martin's Grand Prix background is extremely limited. It consists in fact of the entry of two 1½-liter cars in the 1922 French G.P., without success. Some 33 years later an experimental single-seater car was constructed on the twin-tube DB3S chassis and fitted with a 2½-liter version of the Lagonda-based Aston six — in place of the blown three-liter unit, probably based on a 1954 Le Mans engine, originally slated for the car. This machine was built specifically for free formula racing and was entered for the 1956 New Zealand G.P., where it broke its engine in practice. Though this particular car wasn't designed to compete with contemporary Grand Prix cars, it was built while design work on the new DBR1/250 sports car was in full swing, and shows that *monoposto* considerations were very much in the minds of the Feltham engineers at the time.

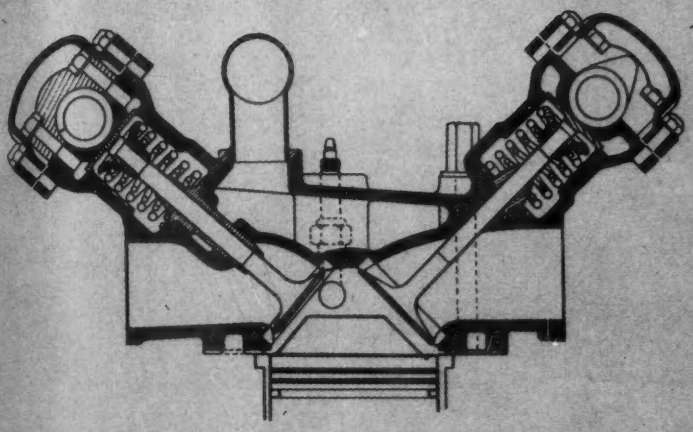
TENTATIVE TESTS

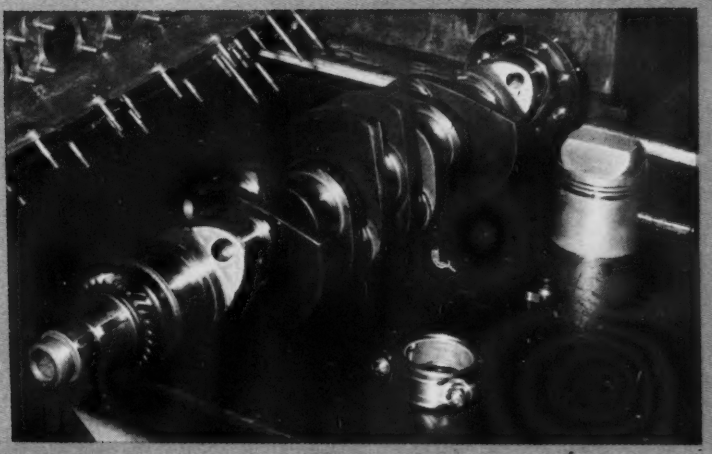
Not long after the DBR1/300 scored the first in its long string of victories, in mid-1957, an Aston Martin Grand Prix car was in existence. Early in 1958 track testing was under way, Tony Brooks being just one of the test drivers who reported that handling was good but power low and weight high. Development was at a higher pitch in October of 1958 when David Brown received a shock in the shape of the 1½-liter formula for 1961. To quote Mr. Brown, "We had to consider very carefully whether to abandon this project or continue for the two seasons that were left. We decided to continue."

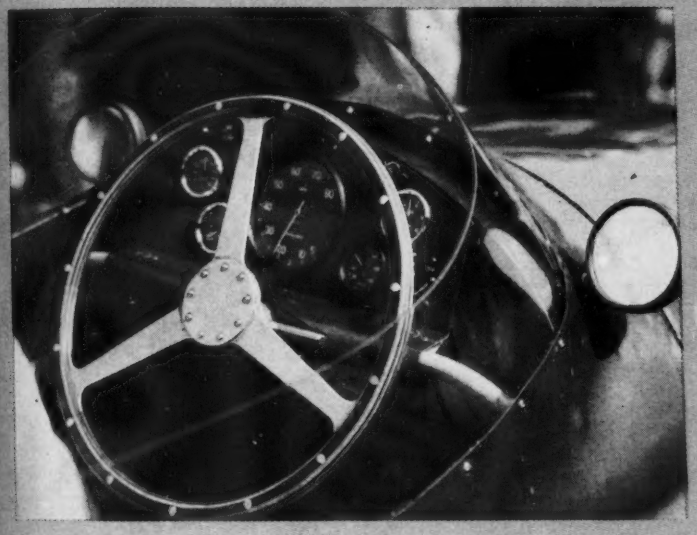
Through the winter of '58-'59 Roy Salvadori handled the bulk of the test driving at Goodwood and Silverstone, under the direction of Reg Parnell. Tony Brooks and Stirling Moss also paid periodic visits to try for fast lap times. Finally the sleek single-seater was felt ready for the racing stage of development. Unveiled on April 20th, 1959, it was entered for the May 2nd International Trophy Race at Silverstone, where team drivers Salvadori and Shelby put in one of their best performances of the season. Second place and the fastest lap were collected. Thereafter the cars were run in the G.P.'s of Holland, England, Portugal and Italy, without success.

LOOK-ALIKES

Just as the DBR1/300 sports car bore a general similarity to the 300S Maserati, so does the DBR4/250 appear to emulate — even more than in the first case — the arrangement of the 250F Maser, a car which has faded out of racing at the end of this formula just as its forebear, the 4CLT/48, did from its *metier* ten years ago. Predictions that the Aston would be able to do no better have been wide of the mark, though. The British cars haven't been winning but neither have they been frequent back-markers. The general resemblance does exist but the detail design and execution on the DBR4 are in accord with its four-years-newer conception. Unfortunately, however, it's not new enough to be fully in accord with the techniques in suspension and weight



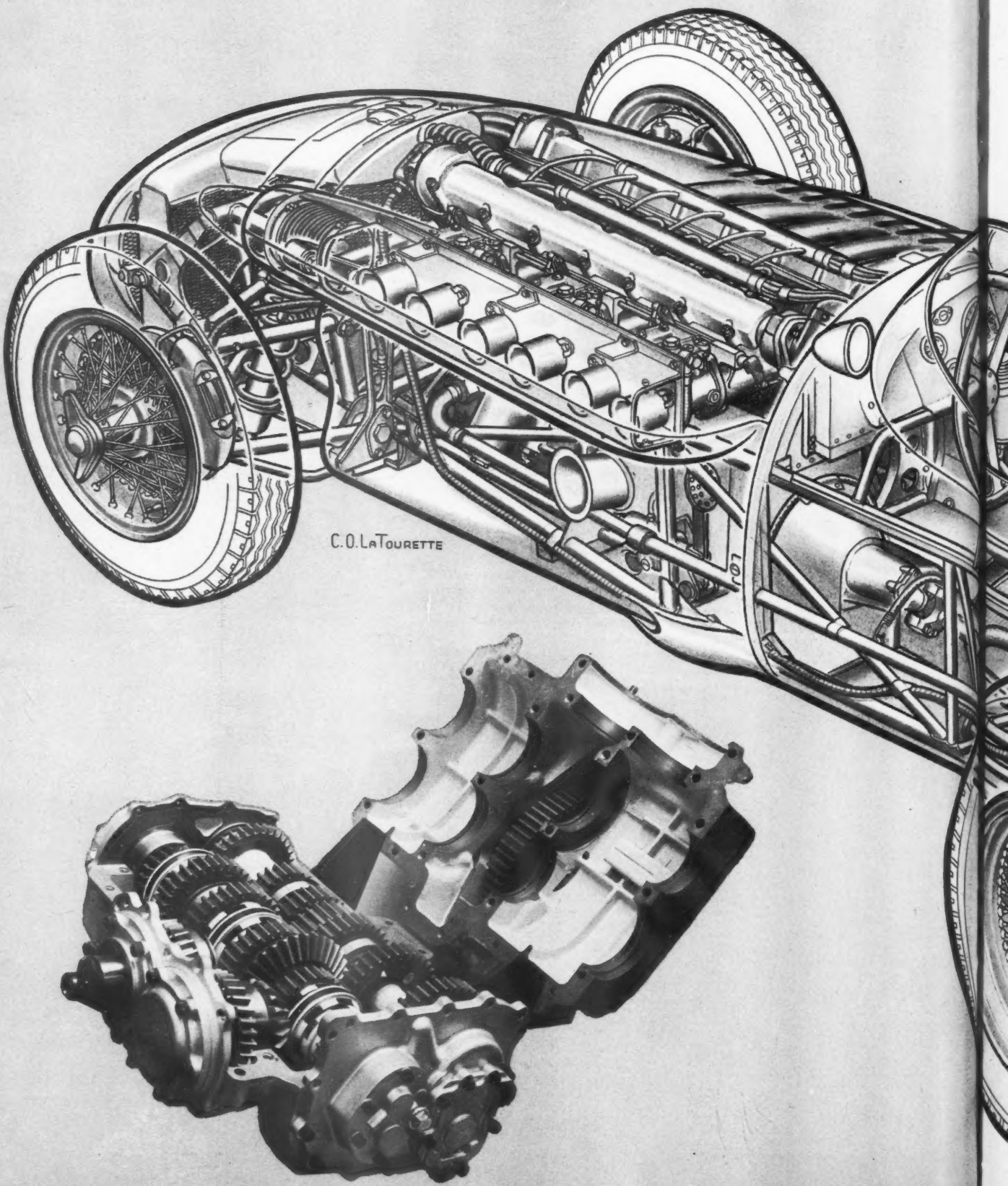


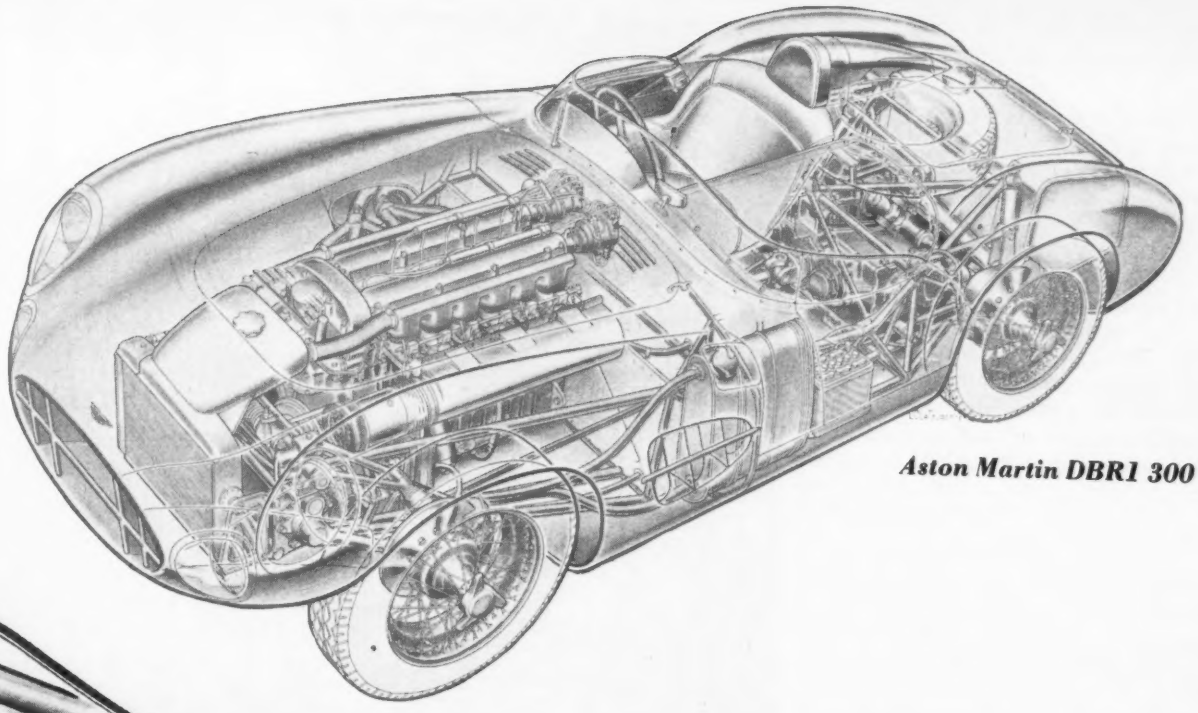


Drawing and photo at top reveal inner workings of Grand Prix Aston engine, from extreme 95 degree valve placement to fully-machined crank and connecting rod. Deep ribs of latter give exceptional strength for weight. Full-skirted piston has radical crown contours. Cockpit, directly above, features instrumentation unusually elaborate for Grand Prix car, part of the inheritance from sports Aston Martins. At right the frame is seen stripped down as far as is usual in routine service, the cockpit bodywork remaining in place. Oil and water radiators are united.

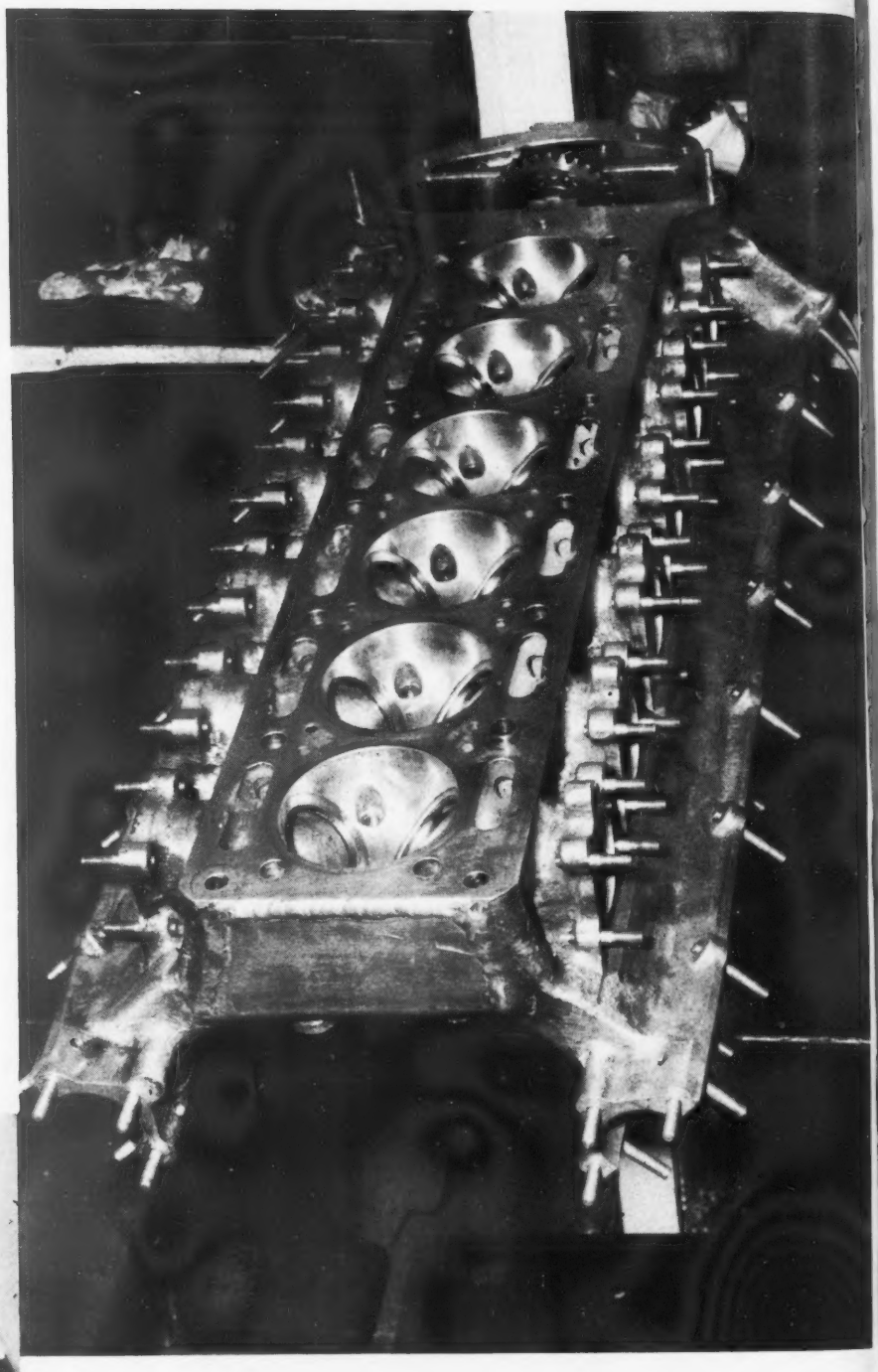
Modern classic design techniques used in new British Grand Prix car, refined in detail to provide near-competitive performance. Major components taken from successful three-liter sports car. New front suspension system principle shared with current Aston Martin sports-touring car.

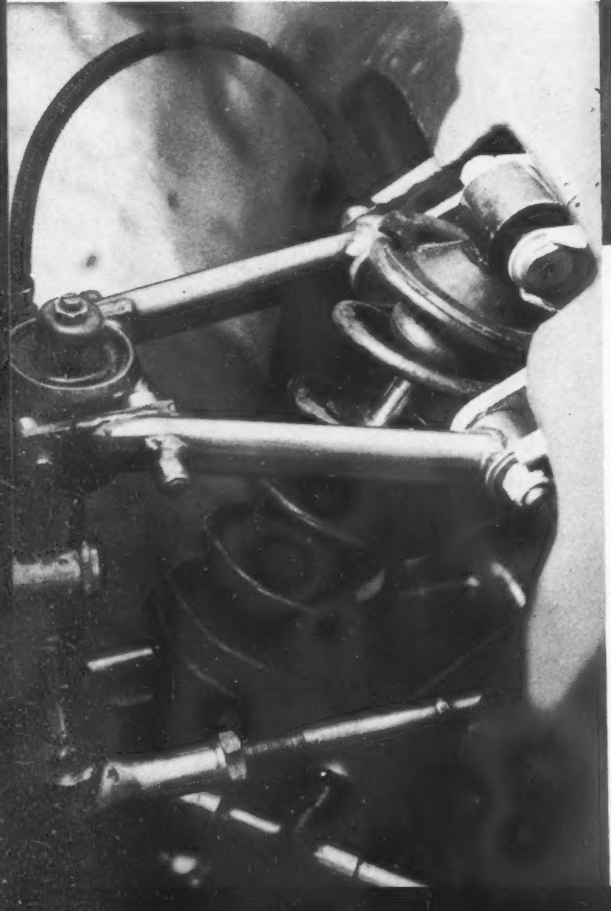
Aston Martin DBR4/250





Aston Martin DBR1 300





Cast of aluminum, the cylinder head is very much a toolroom job, with its extremely complex stud arrangement. Back end, toward camera here, is cast open and closed by welding on aluminum plate. Very deep combustion chambers have contoured plug holes.

Front suspension, seen from front of right-side wheel, was developed on DB3S models and used on DB4 production coupe. Big ball joints are guided by fabricated tubular arms, which in turn are controlled by coil springs, Armstrong shocks and anti-roll bar.

reduction that many G.P. car builders are now employing with an eye toward the 1961 formula. Since he is outspokenly opposed to the 1½-liter limit, and plans to stick to Gran Turismo racing after this season, David Brown isn't too concerned by this point.

As was undoubtedly intended from the beginning, it was possible to use many of the DBR1 sports car components in the Grand Prix car – many of them being from the neat layout of rear-mounted gearbox and de Dion axle. Its two halves bolted together at the center, the axle tube passes behind the final drive casing. Slightly on the short side, the parallel tubular trailing arms that guide each hub are spaced wide apart. Lateral location is by a massive Watts linkage that embraces the center of the axle tube. Springing, lever-actuated longitudinal torsion bars, is damped by tubular Armstrong shock absorbers. Even in these days of independent rear suspensions Aston's Technical Director John Wyer would make no apologies for continued use of the "compromise" de Dion layout, feeling strongly that oversteer in roll is inevitable with most current forms of i.r.s.

NO SYNCHRO NEEDED

With its shafts placed transversely, the massive gearbox rests below the fully-machined half-shafts, in unit with the final drive. Our photo clearly shows the layout of the straight spur gear sets for the five forward speeds, as well as the big final drive spur that carries torque up to the ZF limited-slip differential. We show the sports car version of the transmission, which differs from the G.P. box in having the changeable input gear set so placed that the drive from the engine enters the center of the case. To allow a low seating position on the single-seater the input gear is swung 180 degrees around to the left-hand side of the casing, necessitating a drive line angled across the car as in the Dino Ferrari or "Offset" Maserati.

Rugged dog clutches engage the constant-mesh gear sets, without the aid of synchromesh. At one time a type of synchro was tried but the forces involved in racing use were so violent that the more fragile parts were often damaged. Porsche synchromesh, which the David Brown Automobile Gearbox Division now uses for some truck transmissions, would be employed if a new box were designed. In the left-hand cover of the gearbox is a pressure pump for the dry-sump oiling system driven, like the scavenge pump on the right, by the mainshaft.

Some reports indicated that four-speed gearboxes were tried on the cars last year, at Aintree and afterwards. This would be logical in view of the light weight of this car as compared to the sports version, and the need to lighten this one still further. Reverse is now superfluous and if another gear were removed the entire right-hand end of the case could be lopped off, in effect, leaving a much more compact unit.

Another carryover from the sports car has been the use of Girling disc brakes with cast iron discs and alloy calipers carrying Ferodo friction pads. The drilled brake pedal pressurizes two master cylinders which are replenished by two reservoirs under the right-hand side of the dashboard.

MUCH MODIFIED POWER

Throughout the rest of the DBR4 the machinery is either brand new or very extensively modified for G.P. use. In the latter category is the engine, which naturally is very closely based on that used in the sports/racing Astons. After years of racing with four main bearings it was finally found possible in early 1958 to make up a new seven-bearing block and crank without increasing the overall length of either. The light alloy crankcase continued to extend down and around the mains, whose caps are deeply submerged in the bottom of the block and given lateral bracing by through-bolts. Machined from a hand-forged billet, the crank is given full counterweighting only at selected points – the heaviest being adjacent to the center main. A large-diameter vibration damper at the crank nose is still necessary, especially for this engine which is undoubtedly asked to turn to and over 7500 rpm on occasion.

Also fully machined out of rough forged blanks, the connecting rods are of a new, deeply-webbed pattern that effected a 200-percent increase in strength at the sacrifice of one additional ounce of weight. Addition of three bearings to the crank meant that the widths of the rod big ends and bearing journals had to be reduced, stressing the Glacier copper-lead bearings even more highly.

Full-skirted Hepworth and Grandage pistons carry one oil ring each and two of the very narrow Dykes compression rings a respectful distance below their very peaked crowns. An unusually deep combustion chamber results from valve inclinations of 45 degrees for the intake and 50 degrees for the exhaust, calling for a radical-looking piston crown just to get the sports engine's 9 to 1 compression ratio. Straight bevels rather than recesses in the crown leave the requisite tolerance for floating valve heads.

DEEP BREATHER

By 1958 the Aston team sports cars were regularly using the "95 degree" head that had been tried experimentally in '57, and is carried over to the G.P. car engine. Of aluminum, the head is fitted with cast iron and bronze guides for the intake and exhaust valves respectively, and carries the camshafts direct without bearing shells. The guides for the sodium-filled exhaust valve stems are directly exposed to the flow of the cooling water which leaves the head through manifolding just above the exhaust valve row. Cup-type tappets travel in bores directly in the aluminum, and surround two coil springs per valve. Though the valves and tappets appear light, by racing standards, there doesn't appear to be room for more or heavier valve springs to cope with the higher revs that the G.P. version of the engine must reach.

Twin-throat 45 mm Weber carburetors carry long ram tubes and are bolted up to stub manifolds and intake ports of the same diameter. The intake valve head is 50 mm in diameter, very close to two inches. On the Maserati 250F six the intakes are only 46 mm, but the Dino 246 Ferrari goes a bit better at 52 mm. Both the Aston and the Maserati have 40 mm exhaust valves, far down on the Ferrari's 46 mm. Like some but not all Masers, the DBR4 has two completely separate exhaust pipes servicing the front and rear groups of three cylinders.

STILL CHAIN DRIVE

When the alloy blocks were designed the basic two-stage chain drive to the cams from the old engine was retained, but with the option of substituting a short train of gears for the second or upper chain stage. This is what has been done with the 95 degree head, to good effect. An idler on the chain portion drives the water pump, which is mounted in the timing cover and delivers water to the block through cast-in manifolding. A conventional vertical-flow Marston light alloy radiator is used, with an integral header tank.

At the right front of the block there are two scavenge oil pumps for the dry-sump system which feed directly to the oil cooler, in unit with the radiator, and thence to the reservoir placed in the tip of the tail. A single pressure pump on the left side draws the BP lubricant back and into the engine via a filter.

Superficially similar, the sports and G.P. versions of the Aston engine differ in several respects. Naturally the single-seater has no generator or starter, and also uses twin Lucas magnetos, instead of distributors, to fire the two 10 mm plugs per cylinder. A mechanical fuel pump, driven from the front of the intake cam, blocks off the mounting of a vertical breather pipe as used on the sports car. Symbolic of the higher revs used, the G.P. engine has slightly shorter ram tubes within the big intake air box. Starting with the fact

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an American Rambles Home

By Hile Goodrich and Dick Burnell

► Beep-beep, beep-beep, went the little Rambler 'round and 'round Continental Divide Raceways November 15, leaving other drivers with the bug-eyed look of the Cadillac driver in that horn-honking tune of a year or so ago.

Before the starter's flag dropped for this first endurance race featuring strictly stock "compact" cars and foreign economy sedans, the Rambler generated little interest among other drivers or spectators at the sports car circuit south of Denver. Only one Rambler American was entered, testifying to the lack of faith American Motors dealers had in the car as a competition item.

It wasn't advertised and won't be, but the Rambler Dealers Association of Denver had cast a vote of no confidence in the six-cylinder American when Continental representatives invited them to enter the race. A dissenting voice came from Johnny Mauro, himself the owner of a Rambler franchise until two weeks before the race. Mauro dropped the franchise for reasons not necessarily connected with the race, but he entered a baby blue Rambler American anyway. Mauro knows something about race machinery, having finished eighth at Indianapolis in 1948 and entered six times thereafter.

During practice Mauro and his co-driver, Tommy Rice—a Denver man-about-midgets—attracted little attention. They turned in lap times better than some Falcons and Corvairs, slower than some others. Past performance did little to indicate a first-place finish for Rambler. The engine is downright conservative and old-fashioned. The American's suspension gives it a soft ride, definitely not like a competition machine. The single item in Rambler's favor was its big (195.6 cubic inches) engine that certainly is capable of developing useful torque.

Although Mauro and his Rambler raised many eyebrows, there were other surprises in this first meeting of the compacts and the foreigners. Notably absent from the starting list of 23 cars were Studebaker's Lark and Chrysler's Valiant. Ray Lavely, Continental manager, said Chrysler dealers had difficulty in getting enough cars to allow extras for racing. On race day there was a grand total of six Valiants in Denver for all purposes. A week before the race Lavely was advised that one Valiant would be entered and a Denver race driver took one for a few practice laps around the Continental course. He turned in times that caused Falcon and Corvair backers to lose much of their earlier enthusiasm for the contest, but two days before the race Chrysler dealers told Lavely that they would only enter if they could find three cars to race. They said they didn't want to risk sending in a single car for fear something would go wrong and blacken the Valiant name.

Lark dealers turned down an invitation when they realized the 3500 cc top limit on

engine displacement would keep out the Studebaker V8's—just as it kept out the big Rambler mill. The Study in-line six would have been in Class Two of the race (2501 cc to 3000 cc) with the Valiant and Ford's Zephyr and Zodiac.

Denver Chevrolet dealers lined up the most professional-looking organization. Team Captain Bill Martinez, an old hand in regional SCCA affairs, cornered the market on top sports car drivers in the area, especially those with experience in rear-engined machinery. Number Two car in the Corvair lineup, and the one that led the pack of Chevys, was shared by Bob Donner and Mike Collins of Colorado Springs. Donner holds the track record at Continental Divide with a 73 mph lap set in his RSK. Collins is an up-and-coming Porsche pusher who's done most of his work in a GT Carrera. Danny Collins of Denver, usually a Ferrari man, and John Max Wolf of Colorado Springs, piloted Number One Corvair. Wolf generally runs in an Alfa but he's done fine work in a Porsche too. The two other Corvair pilots, Charlie Lyons and Jim Eichhorn of Denver, have built their own rear-engined specials, using Porsche and VW hardware.

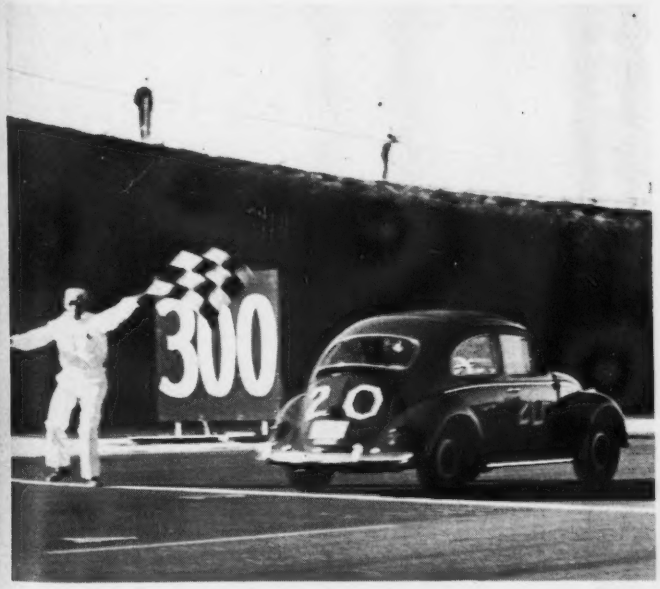
After the flag fell for the six-hour event, the first lap was a mixed-up affair with Corvairs, Falcons, a Volvo and the Rambler trying for the front spot. In the second lap Corky Blair, Denver stock car pilot, took the lead in a Volvo and for a few minutes seemed secure until Mauro began pressing. The Rambler pilot drove conservatively but surely and at the end of the fifth lap moved into a lead which he soon consolidated with lap speeds of up to 58 mph. Blair held the Volvo in second place. Behind the two leaders were a Falcon with Jim Sterling of Aurora aboard, the Danny Collins Corvair, the Donner Corvair and another Falcon driven by Steve Wendt of Boulder.

With an hour gone the race pattern seemed clear—Rambler, Falcon, two Corvairs, another Falcon, Volvo, Corvair, Riley, plus a Falcon that seemed ill and a Volkswagen that was running well indeed. Mauro held a 55-second lead over the Falcon in second place. For the first hour his average was 53.2 miles per hour.

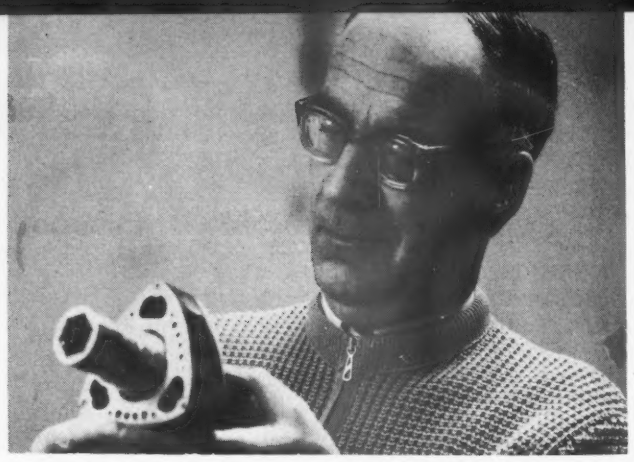
No sooner had the first hour positions been noted than the Corvair bubble burst. The Donner car and another in 12th place driven by Seymour Laff went into the pits for tire changes. Donner came in on a rim. Lyons pulled his Corvair off the course on corner Number Five and drove half way around on a rim. Collins brought in his Corvair for tire treatment as soon as Donner and Laff got out of the pits.

With new tires mounted and all Corvairs back in the race, the top Chevy products found themselves running in sixth and seventh place. Ahead of them now were the Volvo of Jack Miller of Colorado Springs, a Riley driven by John Barker of Denver and a Volkswagen piloted by Joe Doubek of Littleton, Colo.–and the Rambler and two Falcons.

(Continued on page 80)



Above left: Although the Corvairs didn't lean too much, the rear ends hung out pretty wide causing extreme tire wear on rear wheels. Photo above shows one that blew. Left: To everyone's surprise, this VW finished second.



Dr. Fritz Wankel holds the results of 37 years' study and development work: The rotor, one of the two moving parts of his incredible engine.

TOMORROW

The SCI Staff presents a primer for a new kind of power

► A handful of years ago a brilliant mathematician arose from his desk, scooping up a sheaf of papers interlaced with charts and computations. He had set himself the task of calculating the best theoretical construction for an internal combustion engine, and, to his own satisfaction, he had succeeded. However, Dr. Felix Wankel had no earthly idea how to go about actually building such an engine. He needed help from an experienced automotive company. Like countless other inventors before him, with ideas both brilliant and bizarre, Dr. Wankel found little sympathy among the major manufacturers of his native Germany. It was not until he called on NSU, a small but progressive firm whose initials are translatable as Sewing Machine Union of Neckarsulm, that he was able to elicit any favorable response. NSU took the job; today they have a gold mine on their hands.

As the press release puts it, the engine's two moving parts – a rotor and a shaft – work on a "trochoid principle". Webster is no help at all, defining "trochoid" as "the path in a fixed plane of any point in a moving coincident plane when a given curve in the latter plane rolls without sliding on a straight line or an arc or circle in the former plane". Without going into further detail, we can point out that the motion of the rotor in Dr. Wankel's engine is dependent on the rolling without sliding of one circle upon another, an action which takes place along the engine's internal gearing. We'll go no more deeply into technicalities here. On the facing page, in the simplest manner possible, SCI illustrates and describes the way this new prime mover works. We believe you'll find its motions to be hypnotically intriguing.

By late 1957 NSU had brought the engine to a point where licensing agreements could be discussed, and it was at this juncture that Curtiss-Wright entered the picture on the American side. Since that time development has proceeded separately on powerplants of different sizes. NSU's research team, under the direction of Dr. Walter Froede, has con-

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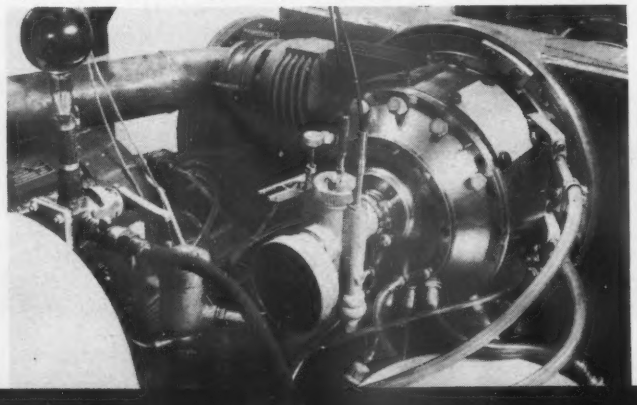
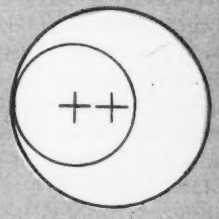
Seen here on the test bed, the very latest German version of the Wankel engine is scheduled to go into production at NSU within a few months.

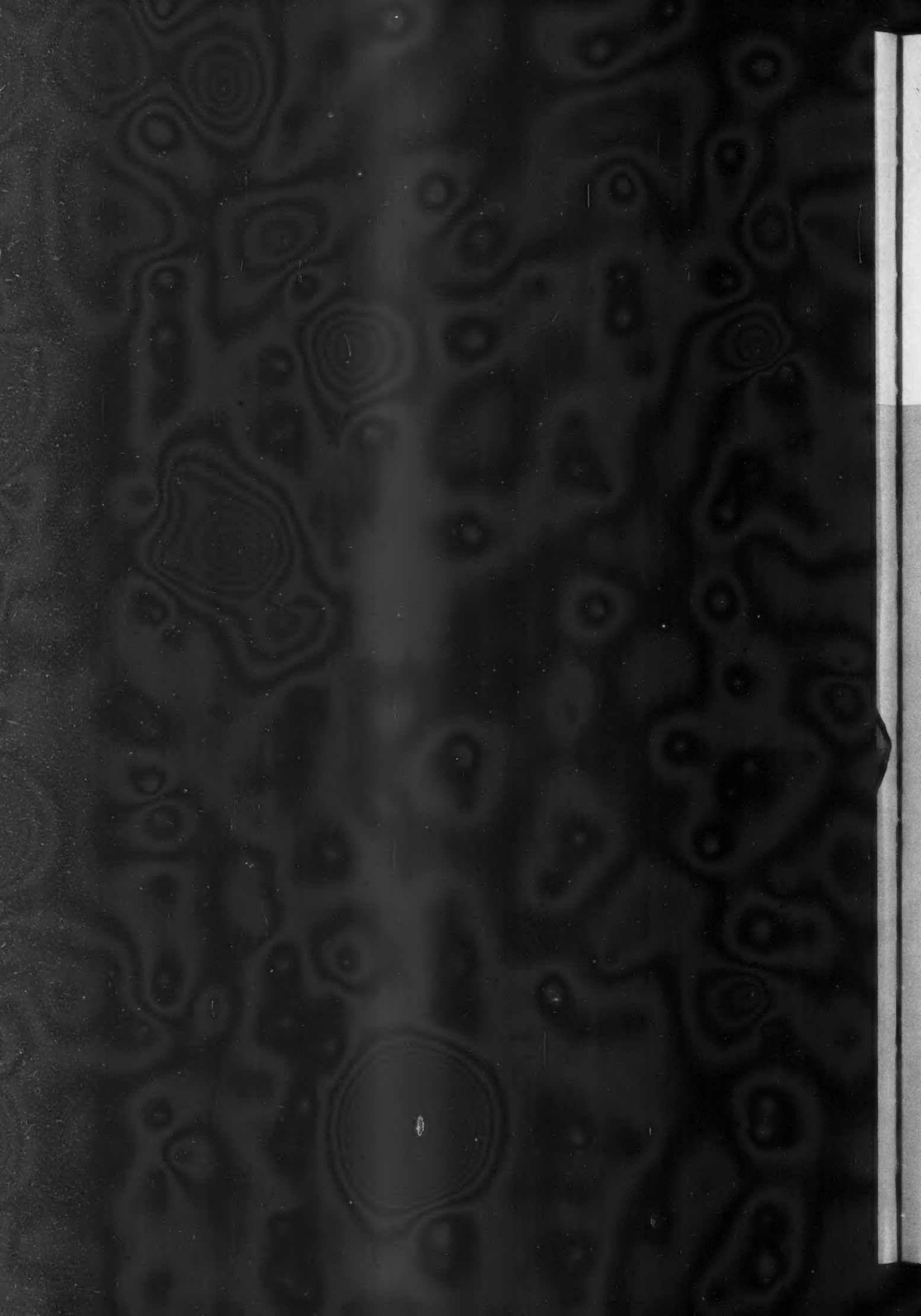


PHOTOGRAPHY: WEITMANN



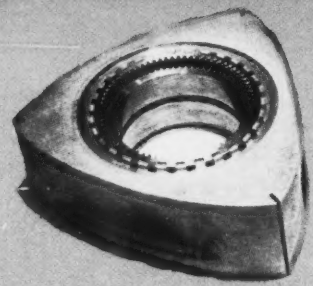
THE SHAFT

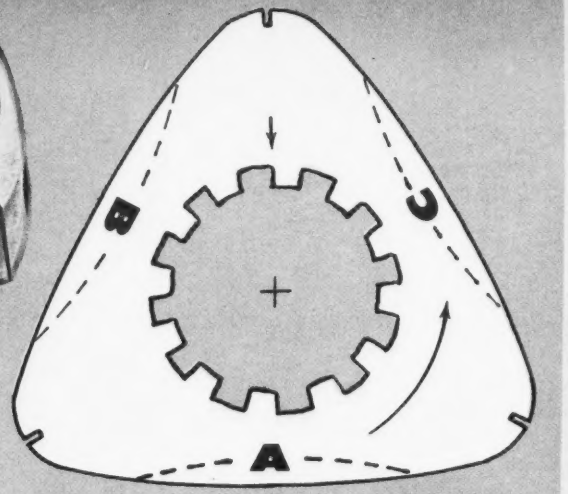
One of the two moving parts of the NSU/CW is a simple shaft, supported by two wide plain bearings, which carries at its center an offset circular bearing journal of larger diameter than the side journals. The larger journal, in other words, is mounted off center, but is at one point tangential to the two side or "carrying" journals. This relationship is shown in the drawing to the right, which is shown to the same scale as the other component drawings. Also shown here are the two counterweights that are splined to the shaft just outboard of the carrying journals. With these, perfect balance for the engine is provided.



THE ROTOR

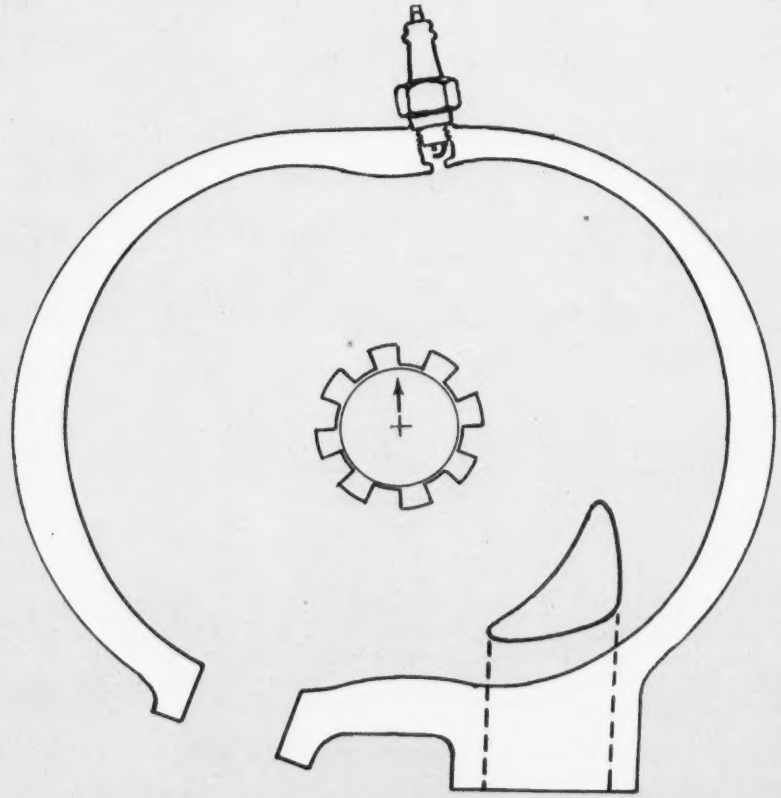
The other moving part is a rotor, so-called, with flat sides and a circumference shaped like a bowed-out equilateral triangle. A large bore in its center is a perfect fit over the off center middle journal of the shaft described above. As can be seen in the photo of the rotor at the right, and as is shown very simply in the scale drawing also, one end of this central bore carries an internally-toothed gear. We show only 12 teeth; the actual rotor could have 72. NSU/CW engines have been built with cast iron rotors, but the American version does have an aluminum rotor at present. The photo shows how the curved faces are recessed in their centers to provide a combustion volume and ease gas flow — as we will try to describe below. The tips of the rotor never touch the casing wall, a seal being effected by spring-backed wipers much on the principle of an oil-controlling piston ring. They travel in the slots shown at the apexes.





THE CASING

The rotor goes through its involved motions within a three-part casing: two side plates and a center piece. Its side walls are machined off perfectly flat — with a controlled amount of roughness to hold lubricant in place — and bolt up against a circumferential center piece whose interior surface is cam-ground to a near-oblong contour. The side walls and center piece are riddled with passages for cooling water, which enters and leaves through the "intake side" of the engine. NSU/CW engines have had cast iron casings thus far, but light alloys can be used to reduce weight. At the geometric centers of the side walls are bores which accept the side journals of the shaft. Anchored to one side wall, around this bore, is an externally-toothed gear which we have shown schematically at right to have 8 teeth, but which might actually have 48. This gear engages with the internal teeth on the rotor, the actual ratio of teeth being 2 to 3. The same side wall that holds the stationary gear is punctured by an intake port, also indicated to the right. Its placement there allows very good control of the incoming fuel-air mixture. The exhaust port is in the center piece wall, as shown. We indicate it as a simple hole, but it is crossed by a diagonal rib to guide the rotor's sealing wipers. One of several possible placements for the spark plug is shown, within a masked hole in the center piece wall.

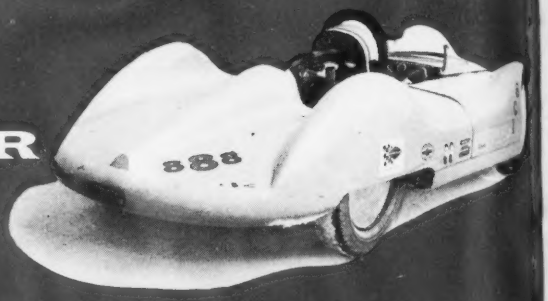


THE OPERATING CYCLE

To simplify a description of the NSU/CW engine's operating cycle, a complex task at best, we'd like to ask you to cut out the schematic drawing of the rotor above — or trace it off, if you'd rather not cut up the page. You'll need to cut out the internal gear teeth too. This done, place the rotor within the schematic casing and engage the internal and external gearing at the points marked by arrows. Rotor side A will be at the bottom. The motion of the rotor around the fixed gear can best be likened to that of a hula-hoop being swung around an active teenager. It can be reproduced here by swinging the rotor around the central gear form, in the direction of the arrow on the rotor, always keeping the gear teeth engaged. If a tracing of the central gear is made on cardboard and glued in place on the "casing", this part might be slightly easier to follow. If the rotor is moved properly, you'll see that its tips follow smoothly the internal contour of the casing in a most fascinating way. The off-center shaft moving on its bearing within the rotor, is simply carried around in a counterclockwise direction by this motion. It serves to guide the rotor, but more importantly, to extract useful power from the rotor's motion.

What moves the rotor? Let's take a look. If you begin the swinging motion of the rotor with the arrows aligned and side A at the bottom, you'll see side A uncover the intake port and begin to draw mixture into the space formed between side A and the casing wall. When side A is at the bottom, also you'll note that the off-center journal on the power shaft would be pointing straight downward. This journal, here, is defined by the tips of the rotor's internal teeth. As you swing the rotor around, when side C is at the top the power shaft will have turned through 180 degrees, and when side B reaches the bottom position vacated by A the shaft will have made one complete revolution. At this point the edge of side A will just have closed the intake port. So during one complete rotation of the output shaft the intake port is open *about 315 degrees or 7/8 of the time!* As the next rotation begins side A is swung up to the top, carrying with it and compressing the fuel-air mixture. When A is near the top the spark plug ignites the mixture and propels the rotor along its counterclockwise way. As it continues to swing about, and the shaft completes its second full turn, the burning gases have been allowed to expand in a gradual and efficient way. Next the leading tip of side A uncovers the exhaust port, and the spent gases begin to escape. The time for their exit extends over *more than 360 shaft degrees!* A slight, but only very slight, amount of dilution of intake gases by exhaust is allowed. Naturally while side A is going through this sequence, one complete turn of the rotor taking three turns of the power shaft, sides B and C are performing other stages of the sequence. There is one power impulse for each 1/3 turn of the rotor, or for each full turn of the power shaft. So many things are happening at once, though, that the inhaling and exhaling periods can be of exceptional length, making usable the very high rotational speeds of which the engine is mechanically capable. This design is truly the work of a genius.

SCI's SUPER SHAKER



► SCI's advertising manager on the west coast is amiable, vociferous Bill Burke. Burke has worked with high-performance machinery for most of his years and has left some historic marks on the sport. In 1947, for example, he invented the wing-tank bodied lakester. Always interested in the challenge of going fast with few inches, Burke built a Class F streamliner in 1952 with which he set the Bonneville record of 136.90 mph, which still stands. When the first Cisitalia reached the coast it was Burke who snatched a fiberglass mold of the body before you could say Piero Dusio. And when John Fox brought the beautiful little Cooper streamliner to the Salt in '54 Burke could not resist making a mold of its shell although he had no distinct plans for its use.

Merely spectating is torture for the congenital contestant. This year Burke succumbed to his better instincts, pulled a glass shell from the Cooper mold and torched up a chassis. The absolutely basic problem in architecting any really slippery machine is tires, with the goal being the smallest rubber that will support the speed. Burke encountered an additional problem: there were no high-speed American tires available that could be squeezed into the Cooper's wheel wells. It seemed that these would have to be cut away entirely when the situation was saved by a set of Goodyear's brand new Grand Prix road racing tires; their 26¼ in. outside diameter was 1¾ in. smaller than the best alternative.

For a power source for the little streamliner Burke turned to motorcycle wizard C. B. Clausen, an egg-head practical engineer whose Hood-Clausen two-wheeled streamliner has been clocked at a world's fastest 224.71 mph. C.B. provided an 88 cu. in. V-twin of his own manufacture; its reemblance to Harley-Davidson practice is only superficial.

With over 130 bhp on tap, burning 50 per cent nitromethane, and with an all-up weight of 587 lbs. for his vehcile, Burke stood to go very fast indeed this year. His top time of 151.38 mph was respectable but well below the machine's potential . . . which was on the order of 195 mph at 6000 rpm. The problem lay in the use of the widely-spaced top two cogs in a three-speed box. An engine of this type will not lug and the revs lost during shifting could not be recovered. One of the watch-words at Bonneville is, "Well, there's always next year." Next year Burke's transmision will be a four-speed with cogs like a tooth apart.

by Griff Borgeson

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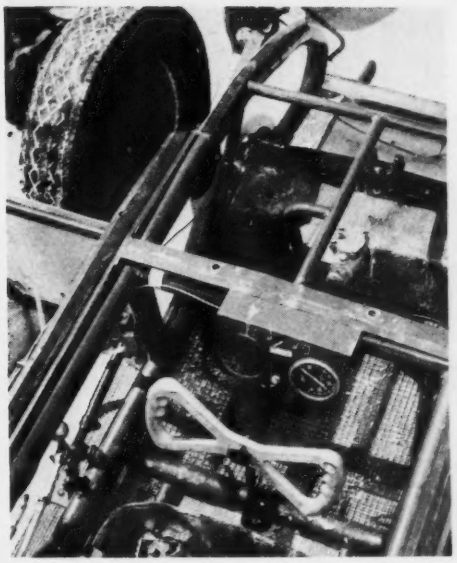
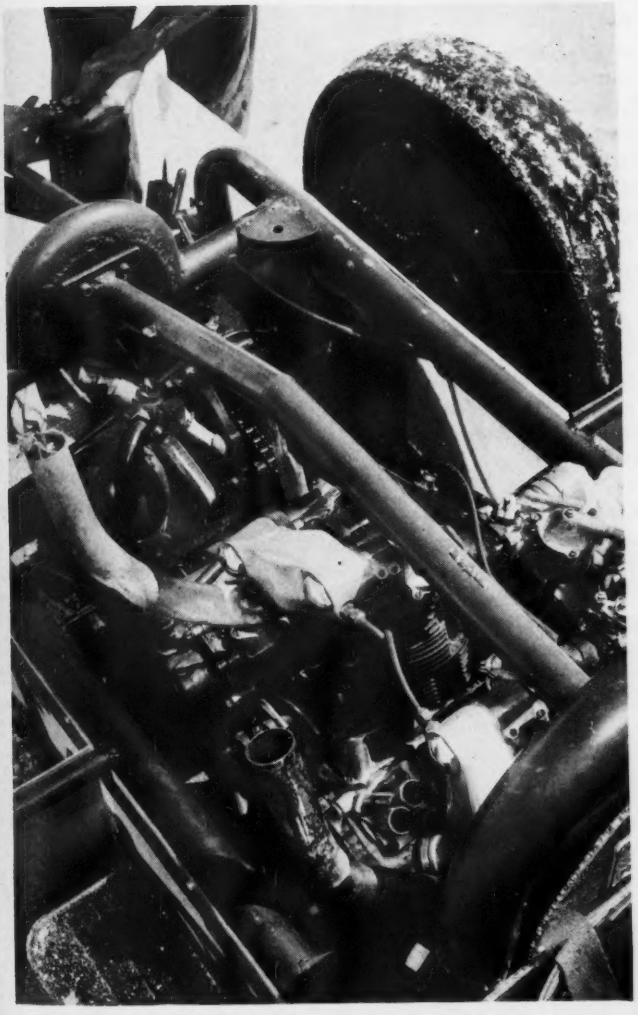
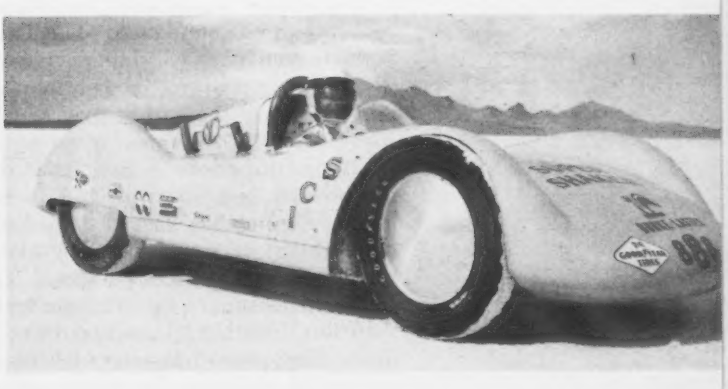
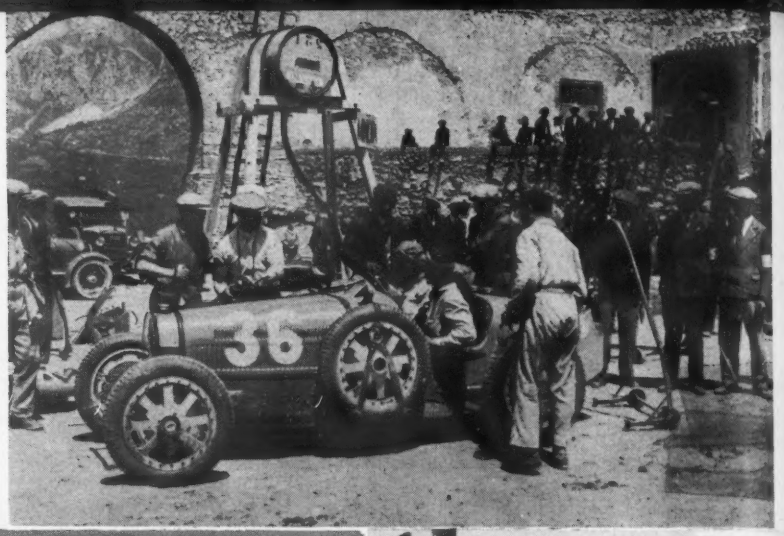


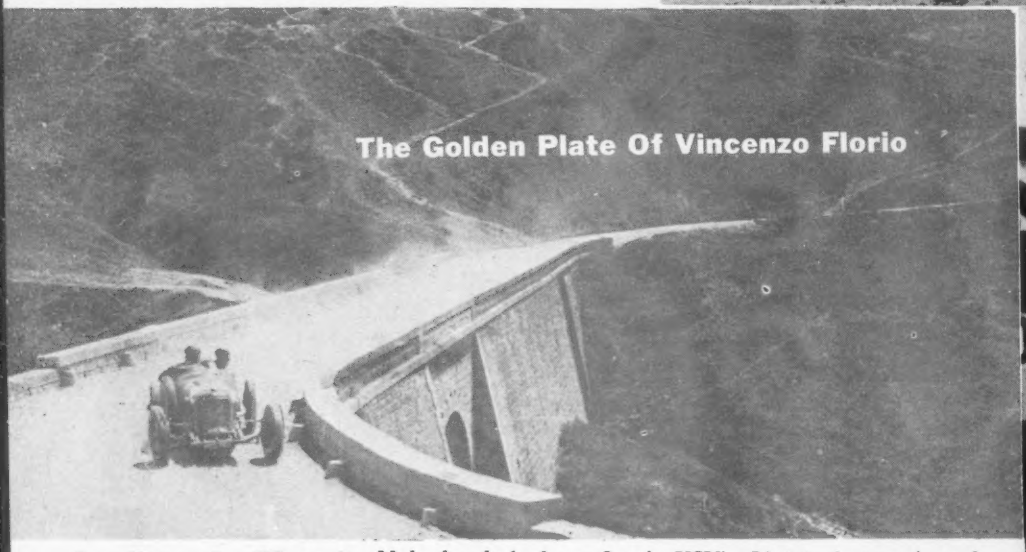
At upper left, drive chain is fed into tiny brute's entrails by Bob Laster, who specializes in sports car engine conversions in L.A. Behind sturdy roll bar of 2½ x .125 inch Shelby tubing, Bill Burke installs fuel pressure pump. Reservoir for dry sump system is in foreground. Above, steering wheel by Chassis Research ties into '37 Ford Anglia box and suspension. Shelby tubes of 2 x .095 inch mild steel form the frame, which is deep-sided for stiffness and safety. Stubby shift lever for wide-ratioed Harley box is at lower left, next to front radius rod end. Clausen turns his own steel cylinder barrels for extensively modified Harley engine to produce 3 9/16-inch bore and 4½-inch stroke, to give 88-cube displacement—at left. Two Riley sidedraft carbs feed fuel. It drives through an axle from a 1938 Harley three-wheeler. Early axle was chosen for its 60 percent aluminum content, which reduces its weight from the usual 100 to 68 pounds. Tires: 500 x 16 Goodyear Road Racing. Fiberglass shell, seen below, was pulled from mold made from tiny Cooper streamliner. Wheelbase is 84 inches, front and rear treads 40 to 38.







Right: Fast refuelling for the Minoia Bugatti in the 1923 Targa. Below: With his slipstream full of dust and flying stones, a 1929 runner makes the long twisty descent from towering Polizzi.



The Golden Plate Of Vincenzo Florio

by Dennis May

► Nobody choked on Louis XIV's *L'etat c'est moi,* and Vincenzo Florio would have been just as safe from contradiction if he'd paraphrased the claim to fit himself and his wondrous automobile race: "The Targa Florio – that's me". It was indeed him. Overriding nervous elders, who envisioned disaster on every vertiginous brink and around every mountain hairpin of the fiercest road course ever mapped, Florio inaugurated his awesome contest when he was twenty-three, in 1906. He personally financed and directed it until the day he died, in January of 1959, in his seventy-seventh year. Times when entries flagged, he licked the deficit by buying maybe eight or ten cars, racing one of them himself and putting the rest at friends' disposal. The skyscraper Madonie circuit in its sundry variants, the least of which was longer than three Nurburg laps placed end to end, made Florio's native Sicily the El Dorado of European motordom.

Here, in the Targa's teething years before WW1, men like Felice Nazzaro and Vincenzo Lancia hit the TDC of fame. Here, in the second phase of the fight, a new aristocracy of speed was spawned, topped by such *campioni* as Masetti, Werner, Ascari Sr., Constantini, Divo, Varzi, Nuvolari, Chiron, Brivio. Here, in 1955, after pensively mulling Fangio's dogma that a 100 kph lap was impossible, Moss floored the oracle by breaking three figures the very first time he raced

Right: Dame Peduzzi's Stanguellini, badly crumpled during the '53 Targa. Below: After World War I, Mercedes made their racing comeback in the Targa Florio in 1924. Here, one of the team cars rounds pit area turn.

PHOTOGRAPHY: AUTOCAR

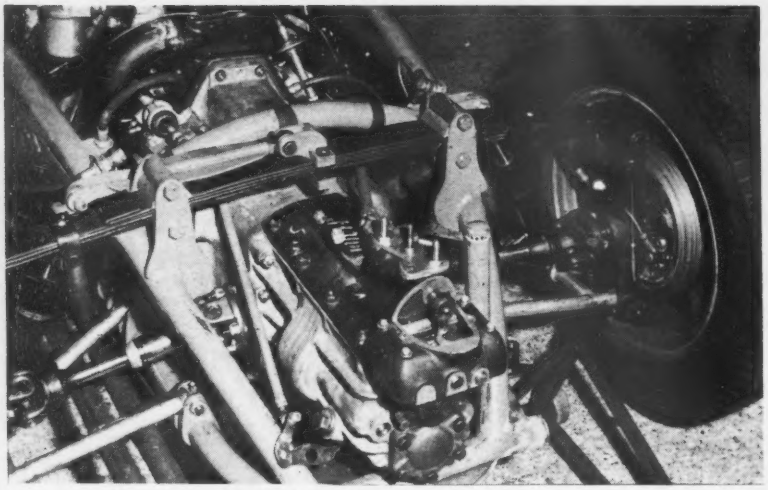
for Vincenzo's plate of gold. (But let's don't forget it was Peter Collins, Stirling's co-driver on the winning Mercedes, who wiped out most of the debt incurred by Moss when he bounced into a field six feet below road level).

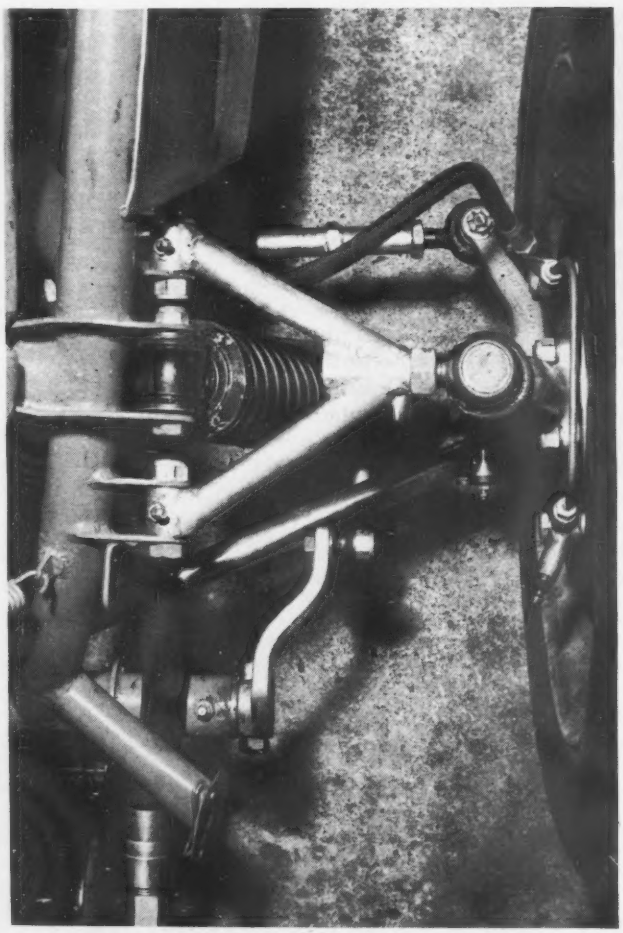
The British had waited a long time for this, their second Targa win – 43 years to be exact. Sole previous success by an Englishman had been in 1912, when a type named Snipe, accompanied by a *tipo* named Pardini, drove an Italian Scat to victory. Along into the second half of the longest race in the series to date–600 miles–these partners learned they were leading by the useful margin of two hours. So Snipe, weary from his exertions, reined the Scat onto its haunches, climbed down off the box and went fast asleep in a ditch. An hour and three-quarters later he was still insensible, oblivious to the *reveilles* Pardini was sounding at point blank range. Finally, exerting a last despairing tweak in his tug-'o-war with Morpheus, Pardini threw a bucket of water in Snipe's face. That did it. Cyril made a vertical takeoff in midsnore, bounded aboard and headed flatout for the finish at Palermo. He beat the next-up crew, Garetto and Guglielminetta with a Lancia, by better than half an hour.

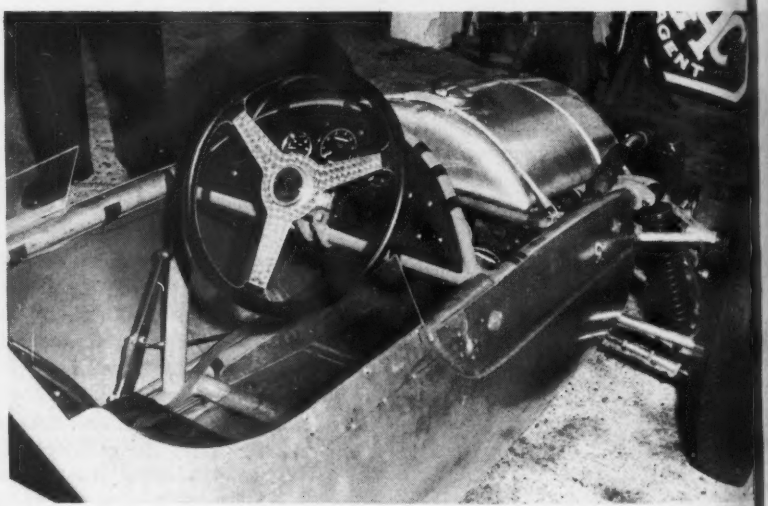
The winners' time in 1912, incidentally, exceeded the modern Le Mans sentence by 37 minutes 19.8 seconds, the last finisher taking nearly forty hours to complete the course, Florio himself, not content organizing the race and mothering the prototype of a new make to which he'd pledged his checkbook – the Florio – made his third and least impressive bid for his own Targa in '12, driving a Mercedes. On an urban section of the itinerary, where it traversed a streetcar route, he absentmindedly followed the tracks into thin air over some temporary excavations. The Merc's tread

(Continued on page 90)

JUNIOR FROM COOPER







Having won the Manufacturer's Championship in Grand Prix racing in 1959 with his Climax-powered cars, John Cooper can be excused for having missed the first season of Formula Junior. Now that he knows it's here to stay, John, seen seated in the first Junior Cooper, has prepared a most suitable car. Its frame design and suspension are patterned closely after the G.P. Cooper, but Formula 3 wheels and integral brake drums are used. As seen at the left a torsion anti-roll bar is fitted to the front suspension and, above, a single fuel tank is placed between the driver and the radiator. A production-type Citroen gearbox is still used, with an A-series BMC engine bored out to 994 cc. Weight is 798 pounds, with oil and water, on an 86-inch wheelbase. When production begins, price in England is to be about $3700. For full Formula Junior roundup, see next month's SCI.

FIAT 1200 TV ROADSTER

ROAD TEST:

► When SCI tested the original 1200TV Roadster by Fiat in the January, 1959 issue, a great impression was made by this sedan-based touring car's outstanding handling and top-drawer finish. This was, frankly, most unexpected since no sporting claims were or are made for this two-seater version of one of Italy's most popular four-door go-to-market automobiles. If something was left to be desired in this first venture it was: one, far less power than the chassis could handle; and, two, styling that was somehow awkward and cliche-ridden. Though it was built by Farina, he apparently had no hand in its design.

Since last January, desire one has been fulfilled by a new Osca-based twin-cam engine soon to be available in the Roadster body-frame. It's discussed on the opposite page in this issue, while our newest test car retains the 60 SAE bhp Fiat engine. Desire two has been created and executed by Farina: as clean and handsome a body as graces any production car.

Wide doors, no longer obstructed by the dog-leg caused by the earlier wraparound windshield, allow as easy entry and exit as can be provided in a car whose seats are very low to the ground. The inside door handle is a nicely-shaped trigger tucked under the armrest where it's easily found and operated, but where it can't cause physical injury in a crash. Roll-up windows are a clinching sales feature in a touring-type sports car, but these continue to suffer from Farinitis: too many turns from top to bottom.

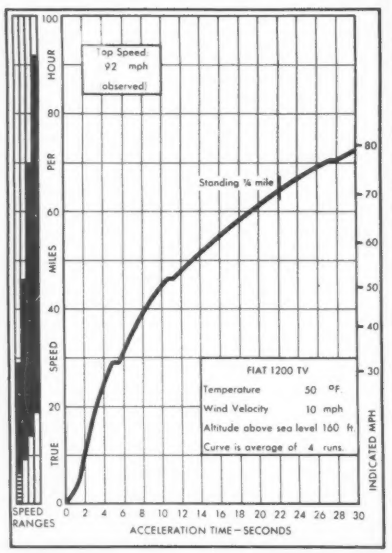
When a two-seater is built atop a sedan's platform chassis, as is often the case in production sports cars nowadays, interior accommodations are sometimes shaped by convenience instead of anatomy. The new 1200TV scores strongly with a roomy cockpit that is completely livable. Cushions of the seats are long and firm to give good thigh support, while the deeply curved backs provide surprisingly effective lateral restraint. A high wheel position and extremely long seat adjustment track guarantee sufficient knee and leg room for the bulkiest or lankiest of drivers. The only customer that

Interior finish on the Fiat roadster is of a very high order. Twin dials, one for speedometer, the other for fuel level and water temperature, are set slightly below eye level. Four toggles below dash control instrument lights, blower, map light, and wipers. Headlight switch is to left of key.

ROAD TEST
FIAT
1200 TV

Price as tested: $2812 plus radio

Distributor: Roosevelt Automobile Co., Inc. 2825 V Street, N.E. Washington 18, D.C.



ENGINE:

Displacement	74½ cu in—1221 cc
Dimensions	Four cyl, 2.83 x 2.95 in
Compression Ratio	8.0 to 1
Power (SAE)	60 bhp @ 5300 rpm
Torque	60 lbs-ft @ 3000 rpm
Usable rpm Range	1200-6000 rpm
Piston Speed $\div \sqrt{s/b}$ @ rated power	2550 fpm
Fuel Recommended	Regular
Mileage	25-30 mpg
Range	250-300 miles

CHASSIS:

Wheelbase	92 in
Tread, F,R	48½, 48 in
Length	154 in
Suspension: F, ind., wishbones, coils, R, rigid axle, leaves. 2 anti-roll bars.	
Turns to Full Lock	1¾
Tire Size	5.20 x 14
Swept Braking Area, F, R	122, 122 sq in
Curb Weight (full tank)	2100 lbs
Test Weight	2430 lbs
Weight on Driving Wheels	50%

DRIVE TRAIN:

Gear — Ratio	Overall	Mph/1000 rpm
Rev n/s 3.38	14.52	4.8
1st n/s 3.38	14.52	4.8
2nd syn 2.09	8.99	7.7
3rd syn 1.38	5.94	11.7
4th syn 1.00	4.30	16.1

Final Drive Ratios: 4.30, no others available.

A TV owner can check the oil level, brake fluid, oil filter, steering linkage, windshield washer fluid, and contents of the sump without ruining the crease in his trousers. Long a weak spot in sports cars, the trunk (below) on the Fiat 1200 is ample for touring.

might feel neglected is the shorter driver, who might find himself looking through the top rim of the wheel; a cushion would correct this. Without elaborate leathers or pretense the thoughtful design and rearward incline of these seats makes them eminently comfortable. Now that Chrysler has made its seats swivel, Farina has given up the feature!

Originally the Roadster used the instrument nacelle right out of the 1200, which was not too sporting. A neater appearance is presented by the twin dials now fitted—one for the speedometer and the other for fuel level and water temperature gauges. Down below the dash are four neat toggle switches which take a bit of learning. A similar toggle at the left of the panel turns on the headlight system, which is then set at parking, dim or bright lighting by a long lever at the left of the steering column. A hand throttle and choke are both located under the dash, marked by succinct symbols.

For serious touring in a roadster, even one as tight as this, a powerful heater is a must. Fiat supplies it, in spades. Though the designations are in Italian the controls are effective, directing the heat you want where you want it. Now much more Farina than Fiat in design, the Roadster's convertible top retains the easy operation that won SCI acclaim a year ago. Sealing around the windows is less elaborate than before but just as effective when the canvas flaps are properly arranged. Unlike the otherwise similar Alfa Giulietta top, the fabric is permanently affixed to the body around the back. Only at or near the 1200TV's top speed do the top sides lift up, above the windows. Since triangular panes were fitted at the door leading edges, it's too bad they weren't made openable, as this would be an aid to effective ventilation with the top up. Summing up the use of inside space, there are only two small pockets for maps and the like ahead of the doors, but plently of room for shopping packages behind the seats. There is no small lockable compartment inside the car.

Pivoting conventionally from the floor, the pedals are more

(Continued on page 95)

First Impressions: FIAT 1500 SPORTS

► Just a year ago a Fiat GT coupe was unveiled at Turin. Under the bonnet was a 1½-liter twin-cam engine. Still in the prototype stage at that time, this engine was designed and built at first by the Maserati brothers at their Osca factory in Bologna. In a very general way – classic dimensions of 78 x 78 mm, five main bearings – this powerplant follows the lines of racing Oscas, but alloy block construction with wet liners has been eschewed in favor of a very production-looking cast iron block. Drive to the twin cams and a simplified valve gear is now entirely by chain, and touring-type elaborations like a water-warmed intake manifold and mechanical fuel pump have been fitted.

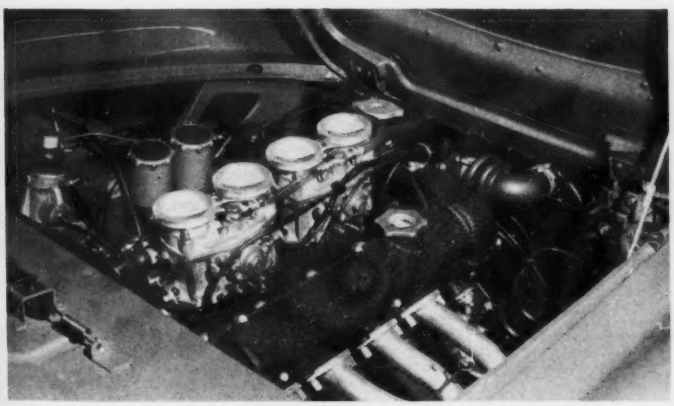
In standard form the 1500 Fiat is basically the same as the 1200 Roadster, seen on the previous two pages, using the frame platform of the 1200TV sedan with a Farina-built convertible body based on the coupe design exhibited in 1958. A removable hardtop for this convertible does exist, but is not definitely available, while Farina also intends to build a small series of the genuine coupe. Apart from the engine and a few spruced-up trim details the main difference between the 1200 and 1500 is the use of the bigger wheels and brake assemblies from the 2100. Now in production at a reported rate of 50 cars per day, this sports Fiat is regarded in some circles as a retaliatory weapon against Alfa Romeo, who have met Fiat head on in Italy by assembling Renault Dauphines there. It will certainly have this effect, competing directly with the Giulietta and many Porsches at a Baltimore port-of-entry price of $3730, but its introduction was probably well founded on serious market analysis.

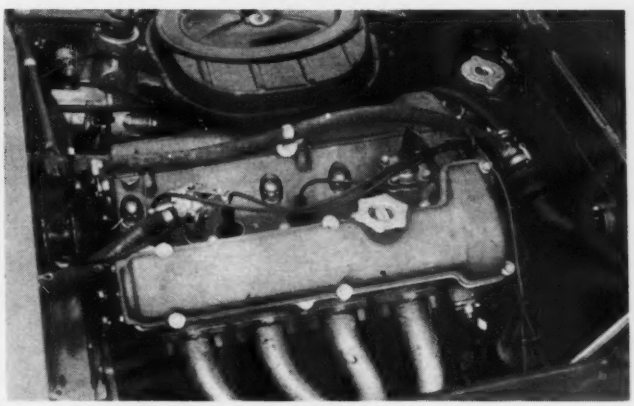
I spent an entire afternoon behind the wheel of the 1500 Fiat in Turin recently, thrashing it up to Sestriere and back – a distance of just over 100 miles. In sum, I liked it very much. The driving position is good, the seats being well-shaped and offering good lateral support. Laid out directly in front of the driver on the imitation wood dashboard are a tachometer and speedometer. The Fiat 1200 gearbox is used, with a sturdy central floor change and synchro on all but bottom gear. There is very little stowage space inside the driver's compartment; in fact it is nil. Except for the large trunk there is no glove compartment, no door pockets or any space at all to put gloves or a camera or even maps – rather surprising on such a car.

At idle the typical twin-cam accessory drive growl is noticeable but this disappears when light throttle is applied. The clutch on this very new car seemed solid and strong, but I wasn't able to determine how long it's likely to stay that way. The Fiat 2100 brakes were very impressive. I punished them brutally rushing down a series of tight mountain hairpins, but was able to stop easily for each one. A series of high-speed hands-off panic stops produced immediate, smooth and even braking.

Though speeds in gears were held to 6000 rpm (power peak is 90 bhp at 5000, but available revs are closer to 6500) the 1500 accelerated rapidly, moving ahead steadily with a noticeable surge as each gear is engaged. Even at low revs in the higher gears there's an instant punch when the throttle is depressed. This car is capable of covering the standing kilometer in 35 seconds and reaching 105 miles per hour.

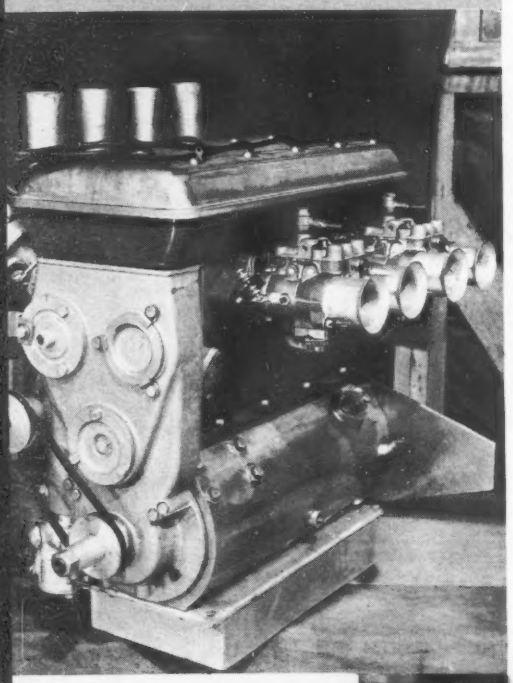
A car we really look forward to trying, though, is the Osca version of this 1500. The Maserati brothers are taking a few of these engines back to their shops and capping them with new cylinder heads which house bigger valves, stiffer valve springs, more radical camshafts, a higher compression ratio (9.5 to 1), and two twin-throat 38 mm Weber carbs mounted in downdraft position in the center of the head – not unlike the Bialbero Abarth arrangement. *–jla*



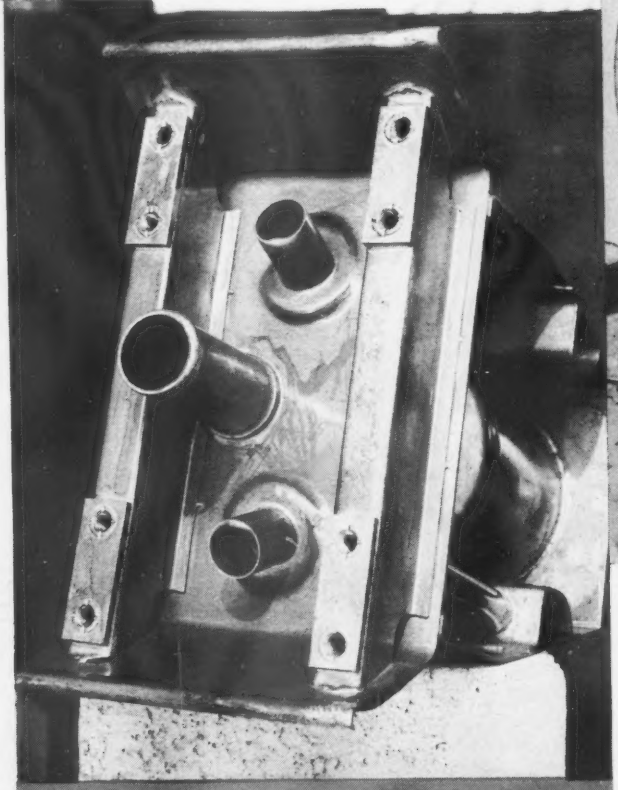


Osca version (above left) of the new Fiat 1500 has two twin-throat 38 mm Weber carbs mounted in the center of the twin-cam head. Production engine (above) looks rather plain with its touring-type air filter and single side-mounted carburetor. Italian body builders have already started to work their alloy tone poems on the 1500. An example (left) is a coupe by Bertone at the Turin show.

This might be racing's face of the future. Fitted out for hydroplane racing, this Tyce-Taylor twin-cam runs the exhaust straight up. Cam shaft drive is by gear and duplex chain.



View up into cylinder barrel shows dished surface of combustion chamber stamping, holes for two valves and spark plug. Brazed seam between two halves of ports just shows between seat and valve guide tube. Sample flange has non-standard hole pattern here.



Central tube is for spark plug and must seal against the cam cover. Other tubes on this single cylinder section are for valve guides and are on cylinder center line. Camshaft bearings bolt to hat section braces. Note brazing copper collected at top of valve guides.

ADVANCED DESIGN IN AMERICA

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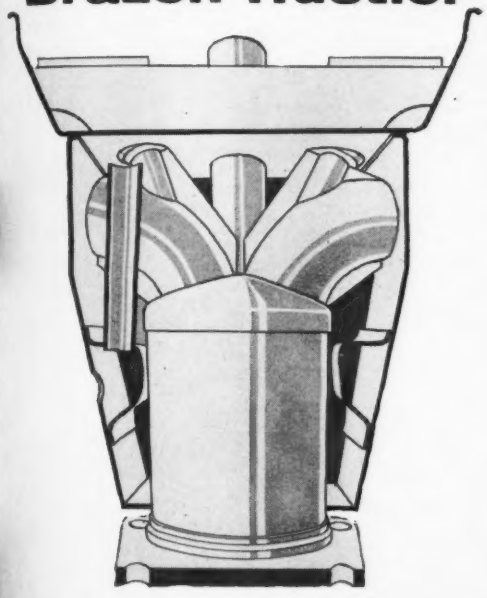
Brazen Hustler



Lloyd Taylor hefts one of his hollow core cranks cast of ductile iron. Five 2.30 inch main bearings plus counterweights on both sides of each throw mean stiffness, good balance and a long life. Three engines offered differ only in stroke.

by Stephen F. Wilder

► Though the five-cent cigar seems ever further distant, Tyce-Taylor Lightweight Engine, Inc. is ready to present the racing engine equivalent. Offered in three sizes, 91 to 135 cubic inches (1.5 to 2.2 liters), the Tyce-Taylor engine will sell for only $1450 and up, F.O.B. Chula Vista, Calif.

The changes in displacement are accomplished by altering the stroke. It varies from 2⅜ inches to 3½, the 2.0-liter (120 cubic inch) engine using a 3⅛-inch stroke. Bore is constant at 3½ inches.

The engine's outstanding technical feature is a welded steel cylinder block, copper-brazed in a 2000°F. furnace.

Horsepower output of 175 bhp at 6500 rpm for the largest version is moderate, by current standards, but the firm's name tips its hand. Quoted weight is only 175 pounds. This presumably is for a stripped engine without flywheel, carburetors or ignition, but even so it is startlingly low. Call it 200 pounds and it still compares well with the Coventry Climax 2.2, which puts out 210 bhp and weighs about 250 pounds. Just as Climax-engined GP cars have been highly successful against the Ferrari with their more powerful but heavier engines, so in turn may the T-T earn a place on the grid.

Though construction isn't, the basic layout is quite conventional. The four cylinders are in-line and water-cooled. The two overhead camshafts are driven by chain. Valves are symmetrically inclined at an included angle of 80 degrees, giving much improved breathing over the Lloyd Taylor's welded steel single cam engine described in SCI, March and April '58. A hollow ductile iron crankshaft rides in a barrel-like cast aluminum crankcase, generally similar to those on the old Astons.

Progress never comes easily, whether it's a culmination of design details, each of which contributes to a higher efficiency, or an intellectual breakthrough to completely new concepts as described on pages 56-57.

Lloyd Taylor is more than a hard worker. He's a man with a mission. He's dedicated himself to building better-performing piston engines than anyone else. Better, that is, *performance*, per pound or cubic inch, not per dollar. His natural target has been the famous Offenhausers.

Not having had his mind molded by a formal education that taught him only how his predecessors did things rather than why, he approaches design problems with a refreshingly direct approach.

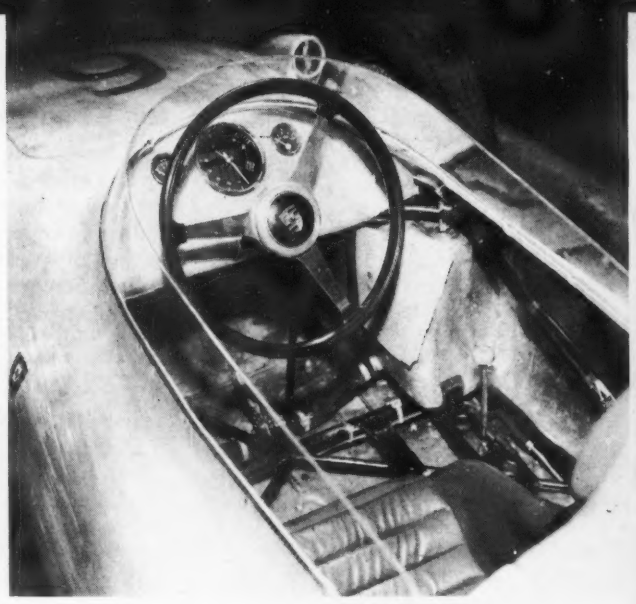
One point on which he finds the rest of the design world has "caught up" is the matter of short strokes. (The Crosley had 2.50 inches bore and only 2.33 inches stroke, making it one of the first production engines to have a stroke/bore ratio less than unity.)

Heat rejection is Taylor's other major area of interest. Poor heat rejection means that the cylinders are in effect swathed in asbestos, holding in heat rather than dissipating it. The high temperatures inside cause spark plug breakdown, rapid oil deterioration and fast cylinder wall wear. Poor heat rejection, says Taylor, is a major contributing factor in many engine failures.

It is inescapable that much of the energy of the burning fuel will be spent in useless heat losses. Taylor's achievement lies not in fighting this inevitable waste but in designing the engine to accommodate the vast flow of heat as comfortably as possible. Hot spots occur wherever there is a large volume of metal with little coolant flowing nearby, so Taylor uses thin, constant thickness sections to avoid large volumes of metal anywhere.

Taylor claims that if you cut a conventional cast block down the cylinder center line, the wear profile bears a strong relationship to the wall thickness as you go from the head gasket to the sump. Many people subscribe to the belief that increased wear at the top and bottom of the piston stroke is caused by low velocities and the momentary absence of oil, but surely the heat build-up due to extra

(Continued on page 94)



by H. U. Wieselmann

Track Report: FORMULA 2 PORSCHE

► On a sunny morning last October I drove to the Hockenheim Ring with Zora Arkus-Duntov of Chevrolet. Porsche had the very fast 4.8 mile track closed off for tire tests, which were in full swing as we arrived. Almost closed off, that is, for Edgar Barth had already had a collision with a deer. It was fatal to the deer but only gave the RSK a harmless dent under the headlight. At once a game warden appeared, assessed the corpse, and then sold it to the racing mechanics at 38 cents per pound! Shortly thereafter the Formula 2 racing car was unloaded—that tiny machine, weighing little more than 880 pounds, with which Porsche had taken its first step into the demanding realm of racing car construction.

Hans Herrmann turned a few laps with it and then brought it back to the pits. It didn't exactly enrage me when racing engineer Hild suddenly called to me, "If you want to, grab yourself a crash helmet . . ." and waved toward the little racing car, gleaming innocently in the sun. The narrow seat was a force fit for my *derriere*. Seating position and pedal arrangement seemed ideal to me, even if I didn't know exactly what to do with my left foot. This wasn't too much of a problem because the clutch foot is usually occupied with its share of work in running up and down the six-speed gearbox. Below 5000 revs the little engine gives forth only inarticulate stuttering and no power.

The speeds lie in three planes, in which gears 1, 3 and 5 are to be found above and 2, 4 and 6 below. The reverse gear, which I sought next among the manifold possibilities offered, is non-existent on the racing car.

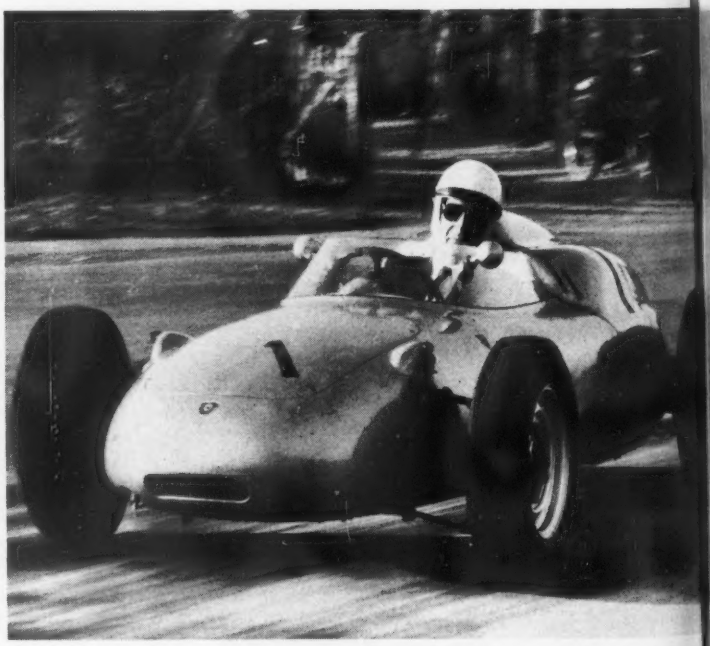
The mechanics pushed me off in second gear; I opened the throttle; in an instant the tach needle was at 8500 rpm—and so it went in each of the following ratios. On the back straight (and not exactly on my first lap) I worked my way up to sixth speed. This "back straight" is in reality a long, drawn-out left bend, which nevertheless has such a generous radius that you can drive through flat out—in spite of a rather wavy surface. There the tachometer reached 7300 rpm in sixth which, we later learned from the rpm-ratio chart, corresponds to 160 mph.

This car, which one can handle as easily as a toy, particularly impressed me with its unusually steady stance in curves as well as on bumpy surfaces, with its very precise and light steering, and with the potency of its rev-ready engine. Exceptional service is provided by the brakes, whose effectiveness and perfect balance were rated better than disc brakes by Stirling Moss after several trial laps of Goodwood in the Formula 2 Porsche. (With it he promptly broke the existing lap record, which he had set up himself with a Cooper-Borgward.) As I came back to the pits in this expensive automobile—of which only one exists—and extracted myself from its narrow enclosure, I was happy as a school teacher who had won the Irish Sweepstakes.

As Arkus-Duntov and I drove back in the twilight, we discussed the ceramic-metallic brake linings which he now employs for racing versions of the Corvette. He maintained that in a race like Sebring these linings, used in conventional drum brakes, could out-brake discs. Since Porsche brakes have performed so well, in the midst of this controversy of drums versus discs, I'd like to repeat here some of the remarks of Porsche Chief Engineer Klaus von Rücker on this subject:

"During the 1959 1000 Kilometer race on the Nürburgring Porsche entered, for the first time, an experimental Carrera with disc brakes. Unfortunately the results were very bad. New brake linings had to be fitted after 27 laps (almost 380 miles) since the original ones were worn right down to the backing plates. It goes without saying that we have been occupying ourselves with disc brakes for some time now, not only because they have been acclaimed by the press as a minor miracle but also because we, as a matter of routine, test anything new that comes along. In this case we obtained disc brakes from various British firms and tried them out. The best set we could buy proved to be

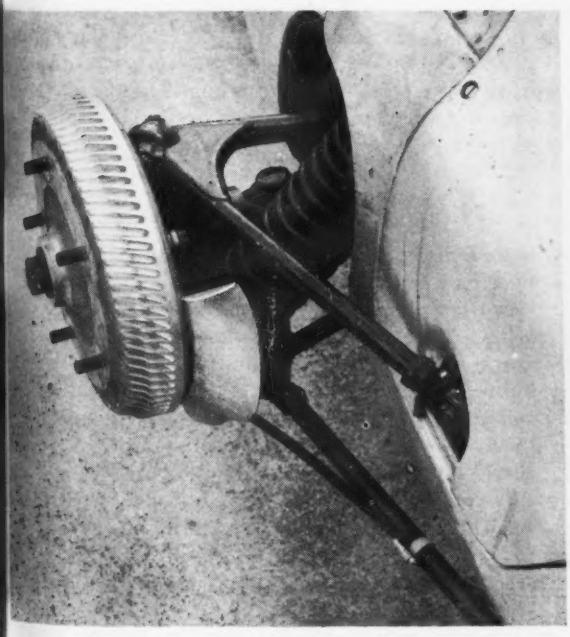
(Continued on page 88)



"It's a delightful little chair on wheels," said Zora Arkus-Duntov after his Porsche ride, "but six speeds are too many from the human standpoint."

Cockpit, at left, is a snug fit even by modern race car standards. Fuel tanks are adjacent to driver's knees. Progressive simplification of rear suspension, below, has left vestigial frame to support gearbox, exhaust.

PHOTOGRAPHY: WEITMANN



Trailing radius rod braces lower "inverted wishbone" of rear wheel suspension system. Air is deflected over drum by simple scoop.

"These brakes are certainly as good as discs," Duntov, at left, tells author Wieselmann, "but you should try one of my Corvettes with cerametallic linings!"

RIVERSIDE RECAP

by John Christy

Phil Hill won $7250 in this practice-scarred 3.0 ex-works car.

Moss in better-handling 4.2 Aston lost oil pressure chivying Hill.

Official leaps into crumpled 4.9 to rescue a dazed Dan Gurney.

► The two Ferraris squatted side by side in the second row of a pack of 31 of the most formidable sports-racing cars ever gathered in this country west of Sebring. The time was two o'clock on a blistering October afternoon; the place, California's 3.725-mile Riverside raceway; the event, the L.A. Times-Mirror 200 mile, $20,000 pro go.

"Luck to you, team-mate," said the tall young man in one of the Ferraris.

"Same to you, team-mate," said the short young man in the other red machine. Somewhere in the cosmos someone snickered.

The luck was all one way—some three hours later one of the two was pocketing $7,250 and the other was nursing an aching head, slammed with brutal force against a roll-bar not two minutes after the good luck wish of his team-mate.

The young man who picked off the biggest single purse ever seen in a sports car race in this country was Phil Hill and the man with the aching head and back was his fellow team-mate in Scuderia Ferrari, Dan Gurney.

What had happened to Dan was simple, nasty and sudden. Seconds after that exchange of good wishes the flag fell and 30 howling, growling cars churned up a rolling cloud of dust and rubber smoke. One did not. Gurney's venerable, Arciero-owned 4.9 stalled on the line, hidden in the sudden smog, dead center on the track. Boiling up from behind after a bad start came Jack Graham, making up for lost time in a potent combination of Aston Martin DB3S and Chevrolet. By the time he hit the dust cloud he was doing a good 60 mph. He didn't even have time to reach for the brakes or even to swerve—the Aston-Chev belted the 4.9 dead center in the tail, slamming the Ferrari into an equally venerable 4.4 in which Rodger Ward had been trying to make an end run around the stalled Gurney machine. Dan, leaning forward trying to restart the reluctant monster, was slammed backward in a classic whiplash, whacking his helmet on the roll-bar. He slumped forward, unconscious as the Ferrari caromed off Ward's car, landing not ten feet from the ambulance and fire truck. Ward came through without a scratch but not so the 4.4. Graham collected a cut lip and a broken arm. If it had to happen at all, it couldn't have happened at a better place. All the machinery for stopping the race, hauling the drivers out of their cars and washing down the cascading gasoline pouring from the wounded 4.9 was within feet of the scene. Gurney and Graham were on their way to the hospital within seconds and the 4.9 was wreathed in CO_2 fumes and water spray almost as soon as it came to a halt, poured on by the Air Force crash crew from neighboring March Field. It was probably the fastest piece of rescue work in the history of motor racing.

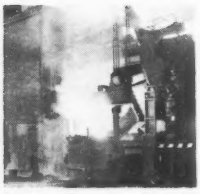
The elimination of Rodger Ward was a secondary piece of irony. Rodger had, in qualification runs, failed to make the necessary one-lap time of 2 minutes, 18 seconds flat, coming through at .59 of a second over that time. This put him at the front of the 10-lap curtain-raiser consolation race. The top three places in this event carried qualification for the 200 miler, Ward's only chance to make the main show. He did it by the simple process of getting out in front and staying there, no easy job considering the fact he was piloting what is probably the most evil handling car ever to come out of Modena and a pretty tired, tattered version at that. (See "Miseries At Meadowdale," page 40.) So Rodger made the main show, only to be slammed out of it at the start.

It only took a few minutes to clear up the debris but almost 45 minutes went by before the final hazard was cleared away for a re-start. This was the lake of gasoline that had spewed from the ruptured tanks of the 4.9 and the equally large lake of water used to flush it down. A combination of cement powder, busily pushed brooms and the hot California sun finally did the job. *(Continued on page 96)*

DOES A HILLHOLDER HOLD HILLS?

No, but with it you can hold The Lark on a steep hill without ever touching the brake pedal. It's a simple optional device of convenience, but one that you won't find on other cars. With Lark synchromesh transmission, braking action on hills is maintained simply by flooring the clutch pedal. Prevents rollback and is particularly pleasant on icy, slippery hills where starting is even more difficult when you get off the brake. (You hill climbing San Francisco readers *need* this . . . yes!) Why do we make such a "thing" over a mere hillholder? Simply to point out that Studebaker engineers and design people are a very thorough lot. You'll find a very high degree of skillful detailing and ingenious design in The Lark plus a variety of features other new dimension cars don't even have available: headrests, reclining seats, limited slip differential, choice of axle ratios, 4-barrel carburetor for the V-8 (0-60 in 9.5 seconds) . . . even air conditioning and a considerable list of other items including such mundanities as three types of radios. The Lark is a car of delightful surprises . . . particularly when you drive it. Tell your Studebaker Dealer to demonstrate on a twisty road. You'll "get the message" and you'll –

LOVE THAT **LARK** *BY STUDEBAKER*



Europe's Common Market

from page 33

most larger firms have lately expanded their plant facilities or are in process of doing so. American-owned companies are up among the leaders in the march to bigness.

The "Americanizing" of Europe's auto industry has also been marked by a number of mergers and consolidations in which financiers—rather than engineers or production men—are calling the shots. Daimler-Benz's acquisition of Auto Union and, more recently, of BMW, has made it the largest car-producing combine on the continent, and second in Europe only to the British Motor Corporation. Now that Daimler-Benz has absorbed its only West German rival in the big-car field, no one will be surprised if BMW's 8-cylinder sedan disappears from the scene.

Cross-marketing agreements are also part of Little Europe's expanding auto scheme. Italy's Alfa Romeo and Germany's NSU are now distributing each other's cars; Alfa also assembles and sells Renaults, in exchange for which Renault has taken on the Alfa line for France.

In addition to horning in on what had been Fiat's near-monopoly in Italy, French and German producers have been leapfrogging borders to the north. New and expanded assembly plants in Belgium and Holland are turning out more Dauphines, VW's, Citroëns, and other Common Market cars.

This broad resemblance to American ways of doing business is by no means accidental. A primary purpose of the EEC is to forge some of the same market conditions that helped our own industrialization and motorization. It comes closest in the number of potential customers—165 million, or some 10 million less than the population of the United States.

As customers for automobiles, however, their differences are more striking than their similarities. The purchasing power of the average Common Market consumer is about half that of his U.S. counterpart. Of even greater significance to the future of cars is the fact that he lives in considerably tighter quarters. The combined land area of Little Europe's six member nations is about one-seventh that of the United States. So it is hard to see how the Common Market would find parking space—let alone driving space—if its vehicle population ever started approaching ours.

Yet while this may be one of the ultimate objects of the Common Market, it's not likely to come about very soon. If Americans parceled themselves out three to a car, every man, woman, and child could hit the road at the same time. France—which leads the Common Market in car ownership—would have to squeeze twelve people into each car to achieve the same mobility. In Italy—the least motorized member—there are now 35 people per car.

Thus a vast untapped demand as well as compact geography will continue to favor cars that are both small and economical. But with output pushing 5 million cars a year in Western Europe—including some 3 million in the Common Market—the postwar industry faces its first real scramble for customers.

Competition has already shaved prices. Continued pressure will decrease model variety by forcing manufacturers to concentrate on popular makes. More integrated manufacturing is also part of the pattern as large manufacturers try to cut costs by making more of their own parts. Many of the assembly plants now spread out over Europe are expected to turn shortly to full-scale manufacturing. This will add more countries to the list of auto-producers, though most of them will be making similar cars.

But the American experience will be mirrored in other ways that are new—or almost new—to Europe. The best customers for new cars are always found among people who already own cars. So a general increase in sales calls for an acceleration of the trade-in cycle. It will be helped along by growing emphasis on styling and year-to-year engineering refinements. A wider choice of optional extras fits nicely into this groove: it permits large manufacturers to try new ideas without major risk and to back away if an idea doesn't take hold. (A flurry of automatic transmissions seemed to augur a new trend a couple of years ago; it is now temporarily in suspension.) Options also allow manufacturers to serve more varied buying tastes with fewer basic styles.

As all cars move toward greater standardization within price classes, larger middle-class cars are also becoming more directly competitive in power and price. For their continued success, however, they have to encourage more small-car owners in their natural yearning for more luxurious transportation. Big-car makers have several strong forces working for them, as well as a couple of hurdles that still have to be jumped.

Model changing—a factor they can largely control—is the biggest inducement for middle-class buyers to trade in and trade up. It's generally believed — and probably true — that Europe's cars are built to last longer than ours. A larger measure of hand craftsmanship may have something to do with it; smaller cars with less gadgetry also have fewer things that can go wrong. But stable, year-in, year-out styling also adds its mite to the general view.

The fact is, however, that cars do get older, even if they don't show it on the outside. As car use increases—and especially as new and faster roads are built to serve them—some of the signs of car age are likely to become more noticeable. The recent opening of Britain's London-Birmingham Expressway is one symbol of the new age in motoring; perhaps other symbols can be read in the fact that on opening day auto clubs received distress calls at the rate of one every six minutes. And at least one driver suffered the acute embarrassment of having his engine fall out.

The tendency of motorists to move upward in the transportation scale is probably just as real in Europe as it is here, though it may be less evident. Millions of postwar Germans, for example, progressed in steps from bicycles to motorbikes to motorcycles. As production and their own finances allowed, they continued to trade up to larger motorcycles, motorcycle-powered cars, and then to compact four-seaters or larger cars.

In most of Europe the trend has tapered off at the small car level. But whether—or how long—it will stay there is problematical. With increasing prosperity and a growing middle class, the high price of gasoline may weigh less heavily with some luxury-minded buyers. But as the Suez crisis of a couple of years ago made clear, the fuel supply is precarious as well as costly, and few manufacturers are likely to forget this.

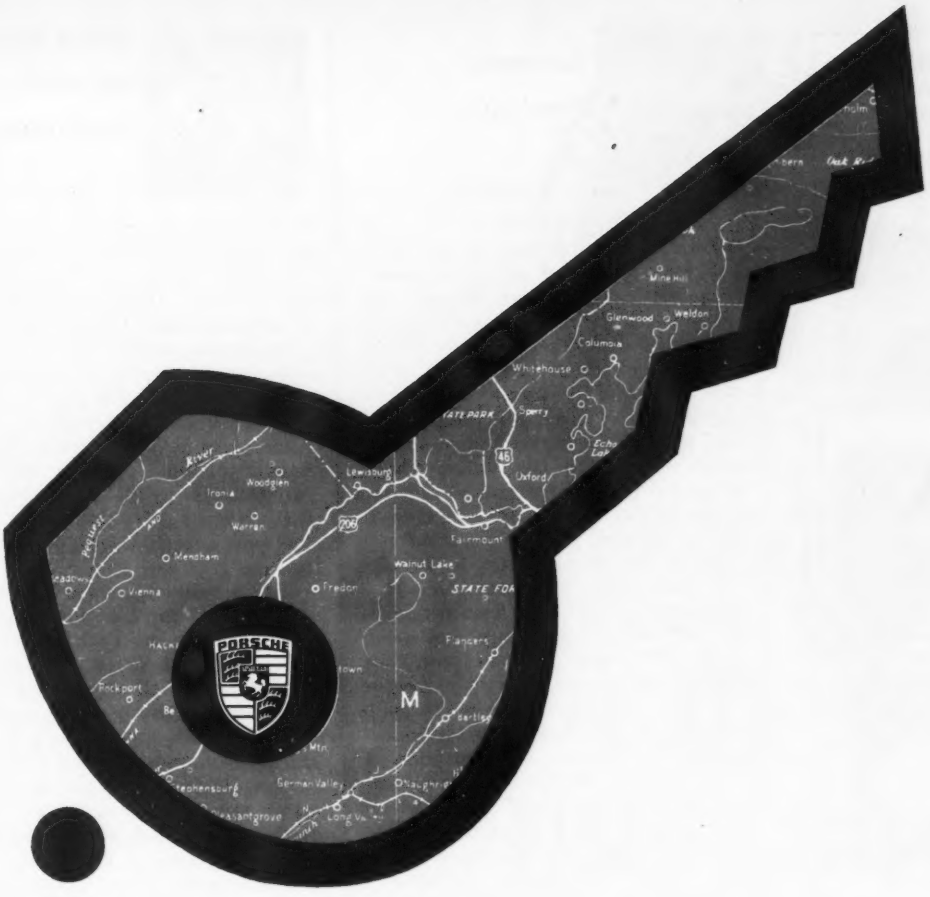
The low resale value of big cars has also served to limit their ownership to the very rich. In Germany you'd think twice about buying one because the annual use tax (and some other fixed charges) is based roughly on a car's horsepower without any allowance for age. French tax collectors, who are apt to relate engine displacement to income-tax assessment, have done even more to depress the second-hand market in big cars.

Tax laws aren't necessarily permanent, of course. Some of the ones that hinder trading in new and used cars are likely to be softened as West Europe gears up for a colossal autobuilding jag. And in spite of major differences in politics, economics, and geography, parallels to America's motor history stand out everywhere.

So in the great outpouring of new cars, you'll see a fadeout of small companies and specialty models balanced by a growth of huge combines and popular makes. With Sweden, Belgium, and Holland leading the way, more West European countries will enter the camp of important—perhaps major—manufacturers. Though the market will be overwhelmingly dominated by small cars, new selections of middle-class and luxury models will whet buyers' appetites, make them increasingly style-conscious, focus attention on year-to-year refinements. Look also for a gradual speeding up of the trade-in cycle and an addition of big-car options to popular-priced economy cars.

The outstanding significance of the Common Market in this American-style revolution lies not so much in what it has directly accomplished as in the historic turning point of which it is a symbol: an industry built by shortages and shaped by exports is now digging for customers at home. Assuming continued prosperity, more efficient production and distribution will put millions of new drivers behind the wheel. As America has already learned, this is a beginning that has no end.

—*rg*



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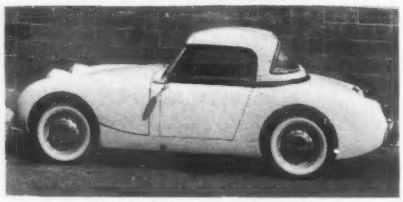

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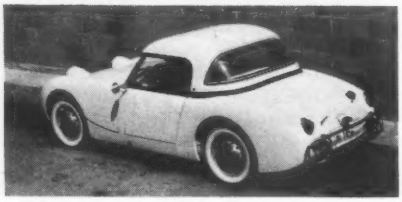

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European Newsletter

from page 18

DUNLOP DOES IT

Dunlop's rise in the field of racing tyre design has been one of the main features of Formula racing during the past two years and such has been the work of their design department that it is no uncommon occurrence these days for all of the cars in a Formula One race to be equipped with this make of cover. It is not generally known that, in the interests of promoting Ferrari's chances in the Italian Grand Prix, special tyres with treads of abrasion resistant rubber—code name R5/C—were made in 16" size. Just how critical tyre size can be was demonstrated by the discovery that with 6.50" section covers 2 wheel changes would have been necessary, with 7.00" covers one change was essential with all the team drivers except Tony Brooks, whose smoother driving technique would have enabled him to go through without a change. Clutch trouble unfortunately put paid to a demonstration of this possibility. The latest development from Dunlop is the R5/D9 casing whose main feature is the elimination of side wall rubber, rather like the 'open sided' cycle-racing tyre. This gives a lighter and more flexible tyre with a flatter tread, the value of this on a circuit such as Silverstone, is about 1½ seconds per lap. So far as their Racing Dept. was concerned, the introduction of the D9 cover towards the end of the season—it was first seen at the Oulton Park Gold Cup meeting—has created difficulties for the Special Shop which produces these tyres, for the confirmation of the Sebring date has involved them in re-stocking Ferrari with the D9 and also in making 15" covers specially for their lightweight independently sprung car.

FLYING SHOE BOX ANYONE?

Experience with the BMC ADO 19 (mini minor) is accumulating, especially as George Harriman has seen to it that a number of the cars have been put into the hands of motoring journalists on long-term road test. A number of points emerge, mainly good, the snags are being dealt with fast. Possibly the only engineering snags have been difficulties in machining the magnesium gearbox castings and lubrication difficulties with the inboard splines of the drive shafts. The former problem was expeditiously dealt with by a change to aluminum, involving little more weight increase than an extra brief case in the payload, the latter by a new type lubricant and more efficient gaitering. The competition Department have been doing a good deal of pioneer work in obtaining extra performance; although the 100 mph mark as yet eludes them; all the cars in hand—even the single carb car—are reaching 90 mph and cruising at 6700 rpm. Wheel revs at this speed are causing bearing people to think a little—but it really only amounts to about 1300 rpm. Tire wear is another thing, remarkably high and remarkably low figures being attained. —*sci*

Road Research Report: Sunbeam Alpine

from page 39

forward. But it's an unhappy compromise. Not only is it hard to judge the distance of a following car, but many people's eyes have difficulty accommodating themselves to two radically different images.

An outside mirror would be a pleasant extra on the Alpine for keeping track of what's going on over your left shoulder. This is especially true for tall people, as blind spots in both tops are bothersome only at the top. No matter what you think of fins as a styling trick, they certainly make reversing the Alpine into tight parking spots a cinch, clearly defining the car's corners.

The windshield wraps around enough that the last three or four inches of the right-hand blade lift off the surface of the glass. Though there is no dog-leg, the windshield post is well aft of the door hinges, so of course there is the question of what happens to rain water coming off the windshield when you open the door. The answer, sadly, is that it runs onto your knee. Other rain leaks occur at the junction of roof, windshield post and window. The engine, happily, never missed a beat, no matter how much water came down.

The engine is started by twisting the key; the choke is immediately adjacent and is momentarily necessary in crisp weather. Originally the engine idled at 800 rpm but we set it up to 1100 rpm, after a night with the parking lights turned on left us with a flat battery. Subsequently, we noticed that long periods of idling would bring the water temperature up to 200 degrees from its customary running figure of about 175 degrees. In less than a mile of movement it would drop again.

The clutch pedal is pendant, as are the brake and accelerator. It requires a moderately firm push to disengage the eight-inch clutch hydraulically. The stout gear lever, about eight inches long with the shift pattern marked clearly on its large black knob, selects the gears remotely through a linkage enclosed in an aluminum housing extending back from the top of the gearbox itself, as is customary on British sports cars. On the car sampled, the system felt firm and precise in the fore and aft plane but was sloppy sideways. We once mistook third gear for neutral and pulled up to a red light with very juddery results.

Even with tires inflated to 27 and 29 psi, front and rear (two pounds over that recommended for fast driving), the acceleration runs created nary a chirp. With revs up to 5000, the clutch was best eased out, the engine slowing to about 3000 as the clutch engaged. Using the 5800 rpm red line limit, the following speeds were reached in the various gears: 30 mph in first, 47 in second and 72 in third.

At full throttle, the exhaust note is almost identical to that of an MGA, peppy and youthfully exuberant. In the indirects, there is noticeable gear whine, even at small throttle openings.

At lower revs, the 9.2 to one compression ratio helps the engine pull smoothly from

about 2000 rpm, though real torque is not felt until 3000 or so. The specific output is very respectable for a boulevard sports car.

Though we no longer care to test for top speed near our New York offices, the redline figure for fourth gear is an even hundred. If you'd rather "do the century" without so many revs, the combination of overdrive and the attendant change in axle ratio will cause the engine to develop its peak power (78 bhp net) at exactly 100 mph. Of course, another option is to use Dunlop "Road Speed" tires in the size of 5.90 x 13; their 5½% increase in rolling radius will increase shift speeds by an equal percentage, though we are not certain that the non-OD car could pull them satisfactorily.

The test car was fitted with Dunlop "Gold Seal" tires which is their "second-line" grade. We were very impressed with the absence of tire noise during even brutal cornering as well as a surprisingly sure grip on all pavements.

Engine noise, aside from the exhaust note, is hard to isolate aurally from wind and tire sounds, but we consistently observed that on turnpikes our cruising speed would slowly drop from the 60 mph indicated legal limit (or above) to a more comfortable 55 or so where the noise level was less annoying.

Girling discs, 9½ inches in diameter, are used at the front with conventional nine-inch drums at the rear. Though the discs lack any servo effect, there is no booster of any sort fitted. Despite this, pedal pressure is quite within reason. Though the front discs are self-adjusting, the rear drums are not. Evidently, the latter's adjustment must be carefully related to the situation at the front, as on the test car they seemed to be too tight. We noticed that in first depressing the brake pedal there was some retardation with very low pedal force, then, after an inch or so of pedal travel, the pedal became much firmer and retardation much stronger, presumably as the discs began to work. Not a basic defect, this phenomenon is merely something for the particular owner to look for. Otherwise, brakes are smooth and effective, pulling the car up straight, time after time, from high speeds.

The hand brake is the pull-up sort, the button on the end releases the ratchet rather than setting it. It's by the side of the driver's seat which means no one will have to sit on it (and this way there's space for the arm-rest and storage place). When pulled up strongly, its handle sometimes catches the driver's trouser cuff when he's getting out. As the makers claim, the drums do make an effective hand-brake; it really holds the car firmly.

For the first time in magazine history that we know of, we have attempted to evaluate cornering behavior on a quantitative basis rather than qualitative. We have selected a large flat circle of 200 feet inside diameter. The surface is asphaltic blacktop and is quite smooth. Our tests consist of driving around this circle at varying speeds, photographically noting, during periods of equilibrium, both steering wheel position and speedometer reading. As long as the driving wheels are not slipping, the latter can be converted to true speed directly from our speedo calibration

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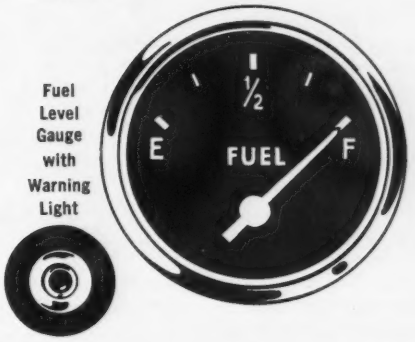

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Road Research Report: Sunbeam Alpine

from page 75

figures. Speed can be plotted against the angle through which the steering wheel is turned.

We have chosen to show this on a photograph of the steering wheel. The wheel itself is at what we would like to name the Ackerman angle, the one necessary for negotiating the test circle at very low speeds. A reference mark is shown at the rim of the wheel. Its position relative to straight-ahead gives an indication of the basic "quickness" of the steering system. Where and how much it moves as speed increases is shown by additional marks. Their position indicates the over- or understeer characteristics *as seen from the driver's seat*. This is not the same information that an engineer wants in designing a car, but it *is* what the driver deals with in driving the car. What the engineer needs to consider (which the driver is happily unaware of) is the elasticity of the steering linkage. It tends to reduce the effective steering ratio.

As the photo-diagram shows, the Alpine, set up as ours was with tire pressures suitable for hard, fast driving, is an understeering car. For a given radius turn, higher speeds require more steering lock, that is, you must turn further into the turn. It also, which is typical of understeering cars, takes noticeably more force to hold the wheel at higher speeds and considerably more throttle opening. Our fastest speed, an indicated 50 (48 true), took full throttle in third gear and could not be maintained in top. Perhaps an overdrive-equipped Alpine could get round faster on this test circle due to the different rear axle ratio.

This particular test pertains mainly to smooth roads and long, long turns. Of equal interest are the transient cornering characteristics. In other words, what happens when you turn the wheel (either slowly or quickly) while going down the straight, how the car behaves entering a turn, what happens when the throttle is opened wide or closed abruptly, and perhaps most important of all (and difficult to describe accurately), what happens on irregular surfaces.

The Alpine features a recirculating ball steering box which minimizes friction. Similar boxes are widely used on American cars. Despite only 3.8 turns lock to lock and no play, small movements of the steering wheel rim have little effect.

Once heeled into a turn, the steering seems to be appreciably quicker, as if the steering ratio were being reduced at large deflections, and small movements give sensitive control.

When well and truly in the test turn, suddenly closing the gas caused the car to tighten its path a bit sharply. At less than maximum speeds, additional throttle caused the radius to grow, which in turn required more steering lock to hold to the intended path, as mentioned before.

The gist of all this is that the Alpine is a very stable car, even when driven hard, but because of the high forces needed, not especially invigorating or exciting to handle. It should never lead anyone into trouble, but if they insist on getting into it, the Alpine will try to help them out of it. From a racing point of view, the understeer would seem to be too strongly ingrained, requiring a strong arm.

From a touring point of view, the Alpine's handling is a great improvement over its stablemates'. The low friction steering gives good "feel of the road" while the ride is a happy compromise between comfort and firmness. Roadsters in this price category cannot yet be expected to utilize independent suspensions at the rear wheels so on rough, irregular surfaces, a certain amount of axle hop is inevitable.

In the opening paragraphs, we pointed out that the technical specifications were very close to those of the MGA. Both it and the Alpine are "conventionally contemporary" in design, but they are far from identical in use or behavior. The Alpine, while not as suited to the race course, scores in general comfort on highway and byway.

The trunk lid's pushbutton incorporates a key-type lock. Being located off the lid and just above the bumper, it was awkward to get at on the test car, but only because the license plate was enclosed in a bulky frame. Annoying too was the misalignment of the lid itself which made it hard to latch.

The trunk's usable volume is harder to measure than to judge, being quite irregular in shape (and therefore favoring the use of flexible canvas cases). The hinged panel separates the luggage from the spare tire which is nice except that it wastes space alongside the tire. It's fastened with two screws which could well be supplanted with snaps. The spare itself is held down with a canvas strap and buckle. The front of the trunk is established by the flexible container for the folding top, a better idea than a fixed partition. The largest suitcase that could fit in is hard to measure, as the lid drops considerably, vertical clearance shrinking from 9 inches at the front to half that two feet back. Maximum width between the two supports is 38½ inches.

In making a sample tire change on the rear, we were impressed by the array of tools provided, especially the nylon pad on the copper mallet. It prevents chipping the chrome on the three-eared hubcaps. These ears are turned inward slightly, so as to be less likely to catch a pedestrian's leg, but also making it hard for a clumsy, helpless female to avoid hitting the spokes as well. Moral, of cousre, is that she should get someone else to change the flat for her.

The jack fits into a socket in the body below the bumper and is cranked up with the same wrench that undoes the lug nuts on the disc wheels. All tools are located at the rear of the trunk, so they are very easy to get at. There are clamps or tie-down straps for all of them.

Removable hardtops are usually offered by accessory manufacturers well after a model is introduced. Sunbeam, though, has come up with an aluminum one in time for the very first cars to be sent here from England. Fitting snugly around the raised windows, it is held down at six places. The two neatest are the pull and twist latches at the rear which hook into the trunk's external hinges. On the windshield frame are two wide, flat, "over-center" latches which seem too weak for the job (one sprung when we undid it). From a safety point of view, their flat, wide arrangement doesn't make up for being located directly in front of each occupant. After these two quick-release, it is discouraging to find that there remain two long bolts to be undone (with an unlovely looking wrench from the tool kit) just behind the door post. Once undone though, the light lid is easily carried away, two people being useful only because of its cumbersome shape.

The soft top is hidden away under three hinged panels which surround the jump seat. Pull the wide one forward and there is the top and also the instructions for completing the job. It's quite a task when the top is new, for it's intended to be very taut when erect. The same style latches are used at the front and we were reluctant to push them "home."

The two tops draw our ire as being the worst (least favorable) features of the Alpine, purely because of the difficulty involved in swapping from one to the other. Tentatively, we would suggest running with one or the other almost always up, in the one case removing the folded top to increase the usable luggage area appreciably.

The hood opens when you pull smartly on the tee-handle under the dash. It is hinged at the front and opens surprisingly little. Equally surprising is that this doesn't reduce accessibility. Though it's hard to show photographically, the dipstick is easily checked and oil and water are easy to replenish, too. The twin Zeniths have their idle adjustments awkwardly placed and in turn hide somewhat the effective four-into-two, two-into-one exhaust manifolding.

The battery is so well hidden we had to check the very complete Owner's Handbook to discover that it nests under the rear jump seat. Well protected from engine heat, it should not need very frequent additions of water, which is a good thing since few people will remember to look very often. Also in the handbook was a dismayingly long list of servicing check points, carefully mapped out on a folded-up wall chart.

American tools will fit the Alpine, as Unified threads are used throughout. The tool kit provided contains quite an assortment of devices. Various wrenches are supplemented by a grease gun, feeler gauges and even a starting handle. Sure enough, behind the front license plate (which hinges aside) is the appropriate opening, useful for setting your own tappets as well as for those dismal mid-winter situations that we hope will never occur.

Rootes Group products have occasionally been described as "Little American" in concept. They share many features with their big Detroit cousins, such as power steering (Humber Super Snipe) and air conditioning and automatic transmission (Hillman Minx).

The Alpine is best classified as the Thunderbird (two-seat, that is) of the Rootes line. Compared to the related sedans, it handles a lot better, and it goes a bit better, yet only its owners will consider it a genuine sports car in the fine old vintage sense of the name. —*SCI*

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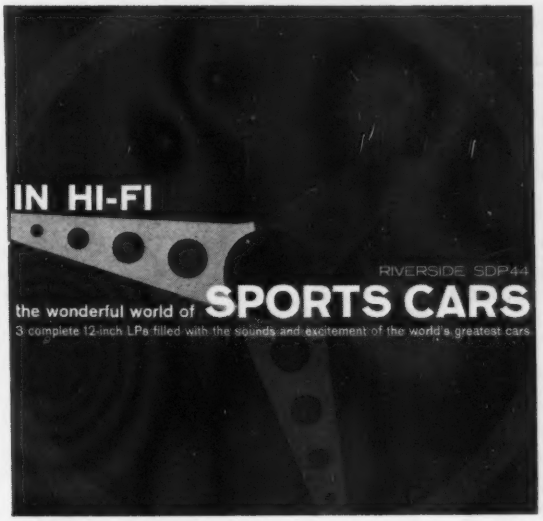
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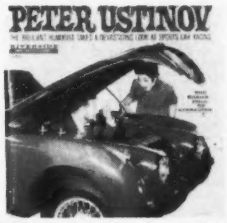

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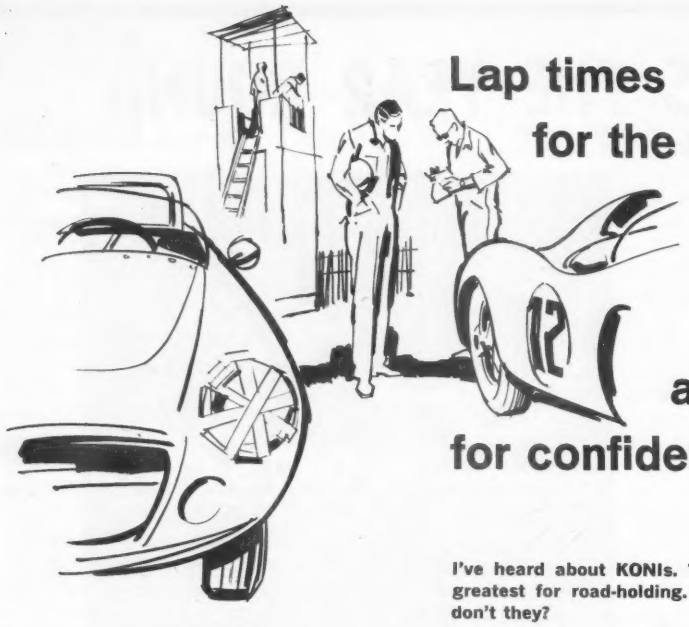

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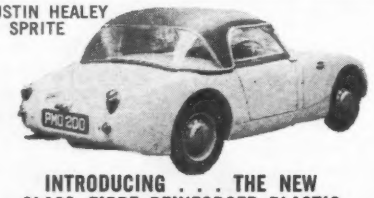

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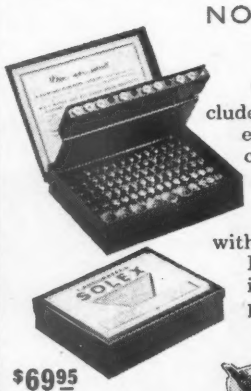

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New Iron In The Fire

from page 53

that the sports engine is reliable up to 6500 rpm, and comparing on the basis of corrected piston speeds, the G.P. version should be equally reliable to just a hair over 7000. 7500 is probably available if needed in emergencies. Output, judging both from performance and from the sports engine's abilities, is probably between 260 and 265 bhp, at or near 7000.

NEW TRUSSED TUBES

Having solved well the difficult problem of designing a space frame around driver and passenger for the DBR1, it was child's play for the Aston Martin engineers to construct a neat trussed structure for the DBR4. Tubing sizes are commendably small and the junctions thoughtfully planned to avoid duplication of effort. For example the front engine mounts are part of the fabricated tower used for attaching the front suspension. The boxed structure at the back of the frame is similarly economical of tubes.

Most of the body panels are speedily removable with the exception of the firewall, cowl and bodywork to the back of the cockpit. These latter are attached when the frame is made and are not removed for routine servicing. Though it may appear so, this is *not* a monocoque structure, however. Like most cars from Feltham, this Aston has body lines that are sleek and simple, and in no way bizarre.

ARMS FROM PRODUCTION

Back in 1957 a DB3S was tentatively fitted with a parallel-wishbone front suspension, replacing the usual Porsche-type trailing link layout. As John Wyer put it later these "experiments were outside the sequence of racing development", a remark that became more meaningful when a similar suspension, fitted with coil springs instead of torsion bars, appeared at the front of the DB4. In lightweight form it is now found on this G.P. Aston Martin, fitted with a torsion anti-roll bar below the lower arms. The spindle-carrying pillar is carried by two big ball joints, and guided along the chosen way by a rack-and-pinion steering gear placed ahead of the wheel centers.

Since David Brown is now embarked on an extensive racing program with the Gran Turismo version of the potent DB4 coupe, based on a relatively new engine concept, it's likely that the DBR4/250 will be the last manifestation of the design themes that came into existence with the DB3 sports car. It's not unfair to say that this single-seater suffers slightly from the David Brown sports car tradition, being more generous of space and material in areas like the cockpit than, say, a Cooper, which came about in a different way: grown up from a Formula 3 car. Unless it's possible to diet some pounds and inches out of this car, and find some more useful power at the same time, it may figure no more strongly in 1960 racing than it did in 1959.

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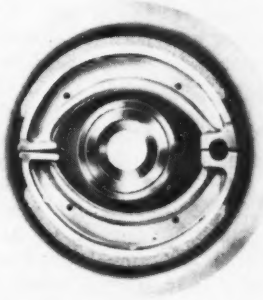

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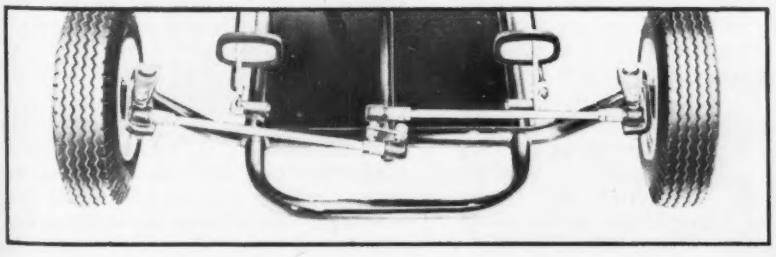

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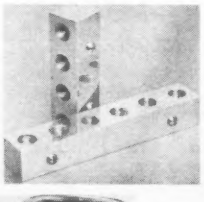

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WRITE FOR ILLUSTRATED BROCHURE

An American Rambles Home

from page 55

During this second hour mechanical difficulties struck. The Falcon shared by Bob McNeal of Indian Hills and Tom Davey of Denver made two pit stops, one for a blown tire. The Barker Riley lost a wheel on a back straight and dropped to 19th place after repairs were made. Miller brought his Volvo in for a pit stop and turned it over to his fellow townsman Dick Sayles. The Volvo re-entered in eighth place.

With the clock showing 11 a.m. and the race two hours old the Rambler and two Falcons were still in their old positions although the Falcon shared by Sterling and Joe Giba of Aurora had lost a lap during a driver change. After the Riley and Volvo delays the Corvairs moved up a notch into fifth and sixth places, but ahead of them in fourth place was the amazing Doubek Volkswagen. Mauro had boosted the race average to 54.6 miles per hour. Corner Number Three, a 90 degree right turn, claimed a Renault Dauphine just before the two-hour mark when Rolf Docterman of Colorado Springs apparently lost control, left the course and flipped in the dirt.

Wendt brought the second-place Falcon in for gas at 11:25 a.m. McNeal, in the other team car, was having great difficulty with his transmission. At 11:20 a.m. he left the pits after a third stop for the car and stalled just past corner Number Two. Twenty minutes later he got the car moving and crawled around the course with the use of one gear. In the pits the Falcon team found the trouble—a slipped pin in the gearshift linkage. From that point the Davey—McNeal Falcon was the fastest Ford product on the course but after all the delays eventually finished 11 laps behind in 16th place.

When the Rambler came in for its first pit stop at 11:50 a.m., the Mauro-Rice pit crew serviced it so leisurely a fashion that they seemed contemptuous of the opposition. They gassed the car, changed the front tires and Rice started to climb aboard. Then somebody shrugged his shoulders, got a jack and proceeded to change the rear tires as well. Rice took the car out of the pits after a stop of nearly six minutes. The tires taken from the Rambler, with the exception of the one from the left front wheel, looked as if they'd been used only for a Sunday drive.

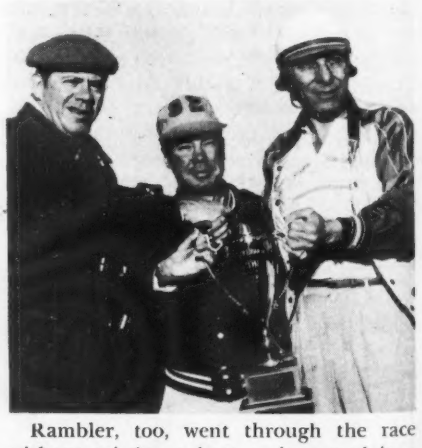
Just a few minutes after noon Doubek brought his Volks in for its first and only pit stop. It was gassed up, someone glanced at the tires, and Doubek turned the machine over to Don Southwick of Denver for the last half of the battle.

The third hour standings after the long Rambler pit stop showed Wendt leading in the Falcon followed by his teammate, Giba, and Rice in the Rambler. In fourth place was the Southwick VW, and the Sayles Volvo moved into fifth after another round of Corvair pit stops. Shortly after noon the leading Falcon pulled into the pits for a change of rubber and more gas. Rice caught and passed the Giba Falcon midway through the fourth hour after a two-lap duel. In one of those laps the Rambler averaged 59 mph.

The big question was then asked in the press box: Would the Falcons make enough pit stops to push the Southwick VW into second place? Both Falcons made a pit stop shortly before 2 p m. The Rambler pits had already made a move and brought their car in so Mauro could drive to the win, provided, of course, that the Falcons duplicated the stop. Tires were changed on the Sterling Falcon, which re-entered the race a full lap behind the Volks. At 2:13 p.m. Pauling brought his Falcon in for a new tire on the left front wheel. The stop took almost three minutes—time for a lap around the course—and Southwick moved the people's car into second place.

Back in the race, Pauling poured on the steam and overtook the Sterling Falcon which seemed to have become ill. At the finish Pauling was 50 yards behind the Volks. Asked later what he thought of the Volkswagen, Pauling raised his right hand and swore: "Honest, I didn't know he was ahead of me. I thought I had him lapped."

A six-hour race isn't the toughest grind in the world on machinery, but it's still noteworthy and highly significant that not a single machine retired from the fray because of mechanical troubles. The four Corvairs that finished still sounded sweet. They had given their handlers not a bit of trouble, apart from chewing their way through what could have been a sizeable tire shop. The Falcons didn't fare quite so well in the mechanical department. The Davey-McNeal machine had the gearshift linkage problem early in the day, and the Sterling-Giba car evidently took sick in the latter stages of the race. But they did finish third, fourth and fifteenth, Corvair taking sixth, seventh, thirteenth and fourteenth.



Rambler, too, went through the race without missing a beat as it turned in a 55.5 mph race average for 333.2 miles. Corvair and Falcon pit crews always peeked under the hood whenever a car stopped, but the Rambler crew left the hood buttoned up, never even bothering to check the radiator. This led one press box wag to declare:

"Now I know why that car is out front. He's got a V8 tucked in there and doesn't want anyone to see it!"

Bench jockies with a yen for recapping races can find food for argument in the tire department. Unquestionably the Corvair's murderous ways with tires cost that marque a chance to duel with the Falcons. But there are dissenters, Falcon team manager Pauling for one. After the race he stated to Lavely that his Falcons ate up just as many tires per car as the Corvairs did, and maintained that the race was on an even basis after all. Unofficial charts of pit stops (there were no official ones kept) refute Pauling's argument. But if Ford wants to advertise that a Falcon can chew up as much rubber as a Corvair any day, we doubt very much that Chevrolet's Ed Cole will argue the point.

Rambler certainly came out on top in the tire department too. The front tires on the American were changed twice during the race, but only one showed wear to the depth of the tread pattern.

Was it the Corvair suspension or was it the tires? Corvair manager Martinez and Bob Donner said it was probably a combination of both. Midway through the race, Martinez was asked if any difference was showing between U.S. Rubber products and the Goodrich tires he was running. None, he said. But at the finish he said the Goodrich jobs were lasting half again as long as the U.S. Rubbers. The Falcons were riding on just about everything: Firestone, Goodyear, Goodrich and German Continentals. Pit crewmen said they could tell no difference whatsoever.

Martinez said that the Corvairs treated tires in a weird way. Cars turning in lap times of 3:05 or more showed only normal wear. Between 3 minutes flat and 3:05 rear tires started peeling. In laps under 3 minutes all four got chewed up.

For the record, the Corvair was able to stick with either the Falcons or Rambler through bends, cornering in a decidedly rear-end-hanging-out attitude. When the car is watched close up going through a corner, the inside rear wheel tends to lift way up and start bouncing if the corner is tight or the surface rough. Roll stiffness in the rear definitely seems to be excessive.

Surprisingly, perhaps, no question was raised about whether the Doubek-Southwick Volks was stock or not. Asked about this point, Doubek said that the car was stock but had been tuned to a fine edge by Willi Hoffmann, a Littleton, Colo. mechanic who served as a pit crew member. Overall, the Wolfsburg marque did very well. Two others finished ninth and eleventh.

Within the limited field of 20 cars, the main competition so far as class results were concerned was in Class Three (2001 cc to 2500 cc) between the Falcons and Corvairs. Here the Falcon got the lion's share of the trophies.

On another day on another track, things might be a little different. And if the Valiant enters a future contest, it might prove to be as hot as its press releases. But after the Rambler American and Volkswagen surprises at Continental Divide, Chrysler's product will have to get out on the track to prove anything.

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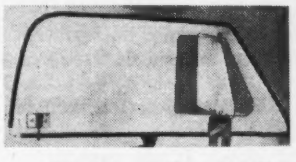

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Miseries At Meadowdale

from page 41

and dirt and was completely inoperative anyway, so he just took the damn thing off!

Out at the track for the first bit of practice I fired up the 4.4, then noticed before I left the pit that the brakes felt bad, the pedal hitting the floor. I felt I should take a couple of laps before complaining. I also found the rubber mat on the floor of the office was tangled up with the pedals, an arrangement not recommended.

I drove a couple of laps and confirmed my suspicions about the brakes. They were almost inoperative. And during this brief period on the track I became reacquainted with all the lousy handling characteristics which I had forgotten. The 4.4 Ferrari, unlike most of the big racing sports cars, steers like it had power-steering. But there's no control of the thing. It steers very light and very easily. But apparently the steering wheel also steers the rear wheels. When you turn to the right, the rear wheels must turn to the left. When you turn to the left . . . well, one guess. If you don't look out, you're on a merry-go-round and you have a helluva time catching the brass ring.

At any rate, I came in and had the brakes set up, tossed out the rubber mat, scooped the caked mud and oil out from under my feet, and took off for practice in earnest.

I rediscovered immediately that you can change ends in this monster as quick as ever. I did it. Twice. I lost it the first time somewhere on the back of the Meadowdale course, which, incidentally, is very crooked and winding and very unforgiving in that there are no escape roads and absolutely no place to leave the course with any amount of sofety.

Another annoying matter was the smoke which the 4.4 blew at 5500 rpms. It clouded up my pretty new bubble shield, making it more difficult than somewhat to see. Later we experimented by lowering the oil level and scored the first triumph of the day. The car quit smoking.

Practice was relatively uneventful except that I managed to lose the pig on three occasions. I had the tail in a sand bank and I was bent out of shape once on the side of a road where a man just shouldn't be bent out of shape. I'll be charitable and not charge this whirly-gigging completely to the 4.4, although I think any other car would have given me a little warning before it turned me wrong side out.

So, while I rapidly grew less confident of the 4.4 it was obvious that Katskee was happy in the Monza. It was painfully apparent the 4.4 was mine to have and to hold for the entire weekend. The pipe-dream was having pups, yet. And that wasn't all.

The rains came.

We were informed a USAC race would not start in the rain but, once started, it would continue to the end, falling water notwithstanding. Every few minutes a cheery voice would gurgle over the PA system that the weatherman had just flashed word that it was clearing up over yonder and a qualifying race would start in just a few moments. He advised the customers to be patient and stick around. They did. It was raining too hard for them to leave.

Finally it slackened. By this time, however, the course was soaked with as much as six inches of water covering the road in some spots. There were great puddles up and down the pit straight. And they called for all cars to get on the starting grid. We did and the rains came again. So they told us to run two laps under the yellow caution flag, just to get the feel of things, and then line up again for the start of the race.

So we took off in the rain, maybe 22 to 25 of us. The rooster tails from the departing speedboats with wheels were such that you couldn't see your fellow drivers. The only thing to do was to look at the side of the road to see where you were going. It did no good to look ahead. All you could see were the rolling waves and the breaking surf.

Jim Jeffords, driving the Scarab for which his angels had paid $17,000, and which had a new Corvette engine, pulled in his periscope and quit after one lap, securing the car for the day. The rest of us had bigger holes in our heads.

After the two caution laps, which was nothing more than a contest to see who could keep on the road, we lined up for the real thing. Katskee and I shook our heads in disbelief but this was pro racing and, well, promoters consider it strictly old hat to pass out rain checks.

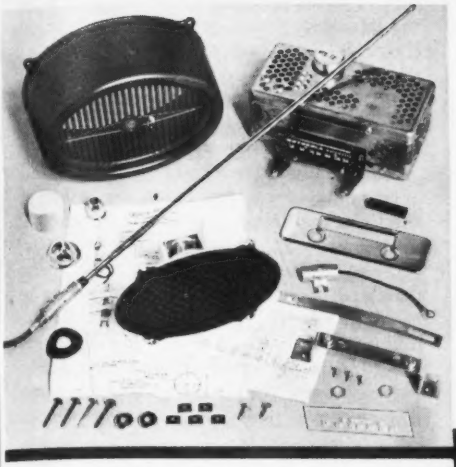
This was my first pro race, incidentally, although I was driving as an amateur. I had agreed to drive for free with any money I might win going to Katskee. And right about here I had some misgivings even about riding a go-cart down the pit lane just for the good clean fun of it.

So they dropped the flag, we thrashed our oars and the race was on—reduced, O happy day, to five laps.

Some of the hard chargers took off as though it hadn't rained for a week but the mist over Meadowdale was a trifle thick and I hadn't been thoughtful enough to bring windshield wipers for my bubble shield. I had elected to use the Australian crawl going down the main straight but this wasn't quite the right stroke and so I was in a favorable position to see the cars before me apparently building up to a four-car clobbering at the first corner. Katskee and Lloyd Ruby in the 4.5 Maserati were right in the middle of the mess but somehow they all straightened out and sluiced around the first turn wtih only minor fender clanking.

Quickly two cars were in the ditch on this first lap. Katskee stuck the tail of the Monza in a sand bank. You're on ice most of the time in the 4.4 when you're on dry pavement, so you can imagine how it was in the wet. But the race, if you can call it that, progressed without serious trouble. I decided right then and there, though, that the next time I'm in a boat race, I'm

(Continued on page 84)



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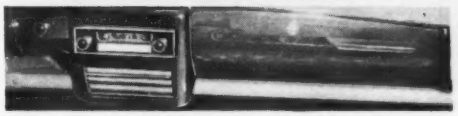

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Mercedes 190 SL	5A-064-W, X, or Y
Mercedes 219	5A-065-W, X, or Y
Opel	5A-057-W, X, or Y
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Taunus	5A-059-W, X, or Y

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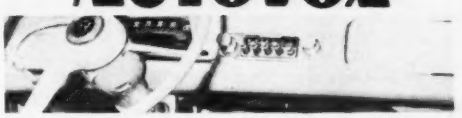

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Hillman Minx, 1959	1B-029-Z
MGA	1B-035-Z
Morris Minor	1B-056-Z
Opel	1B-057-Y, or Z
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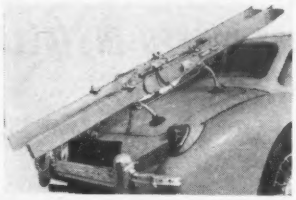

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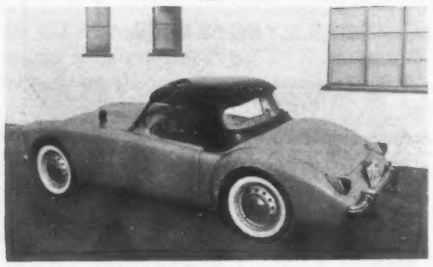

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Miseries At Meadowdale

from page 82

going to have a rudder which works.

Just as an added touch to this absurd race, Katskee came charging up to me from behind on the safety lap and tried to carry on a conversation by sign language and screaming. We went around a couple of little bends and, so help me, Katskee lost the Monza again in a big spin and left the road.

Well, I finished fifth and won Loyal $50. I guessed things could be worse. And so they were, come another dawn.

We did a lot of bench racing that night and I spent some time redriving the course, trying to memorize it. This is difficult since, to me, Meadowdale is one of the hardest courses to memorize that I've ever been on. It took far longer to figure out where everything went than it ever had before on any course.

Sunday was sunshiny and bright. We reached the course early to get in as much practice as possible. About all I got was assurance from the 4.4 that it didn't have the one thing left to hope for—speed. I couldn't hold the Monza on the straight and just barely stayed with Augie Pabst in his 2.5 Ferrari.

Now when you go to a race course with a big animal such as the 4.4, you know you're going to give away time to the smaller cars in the corners. You accept this as one of the facts of life. It's O.K. But you also know, or think you know, or at least anticipate, that you'll be able to make it up going down the main chute. This, of course, was what I was thinking of when I was eager to drive the 4.4. I couldn't forget that tremendous torque and acceleration.

But on this lovely Sunday morning the 4.4 gave every indication of coming apart at the seams. It is very difficult to tell with a Ferrari how well it is running until it starts to fall apart. I could tell real good how well this one was running. It was becoming painfully evident what I needed most was a magnetized rear bumper to keep parts from littering up the track.

We discovered a water or moisture leak around the spark plugs. Knowing this car was famous for getting water in the combustion chamber, I thought: Hang on, here we go again.

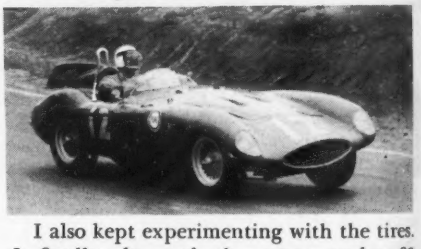
But we didn't go again. The car wouldn't start. It wouldn't start with five men and a boy pushing it up and down in front of the pits. It wouldn't start with the same man-boy power pushing it out on the main straight. It finally started by rolling it down the first hill. It was a wonder I wasn't hauled before the officials for practicing without permission.

So we started practice and right away there was a little sprint race between Ricardo Rodriguez in his Porsche RSK, Katskee in the Monza and Old Honest with the big 4.4. Of course I was nonchalantly bringing up the rear. Charging down the main chute Katskee and Ricardo were having quite a go and Loyal got around him. This apparently didn't set well with the Mexican youth, so he dropped in on the inside. As Katskee backed off a little, the kid started through the vicious right turn at the foot of the main straight. Even as far back as I was I could tell he probably was going too fast.

Sure enough, Rodriguez lost it. He did about a 1½-turn spin from the inside of the track and wound up kissing the outside wall head-on, thereby shortening the Porsche some 30 inches. Loyal went through on the inside as the Porsche bounced off the wall and back into the middle of the road. Of course old Honest picked this propitious moment to arrive on the scene. And having arrived, there was only one place to go — between the Porsche and the wall.

As I said, the 4.4 is a big animal. There wasn't room between the Porsche and the wall for the Ferrari. I took one very fast look, decided the Porsche looked softer than the wall, and clipped it as I went past. I'm sure this did him no noticeable damage since the Porsche already was much shorter than when it started the lap, and there was just another slight dent in the fender of the Ferrari.

During my midnight reverie I had decided that if the car was tail-light, as it certainly felt, what I needed was all the weight I could get in the rear end. So I filled the gas tank to the brim. This proved history isn't necessarily made at night. The car now handled twice as bad as it had before, if this was possible. It still spun like a top. So we siphoned out the excess gas.



I also kept experimenting with the tires. I finally dropped the rears under 30 pounds, cold, in order to get 33 or 34-pounds-per-square-inch hot. This didn't help the old pig, either. But I did get one new tire and a new set of spark plugs and we sallied forth for the first heat of the race.

They told us the qualifying boat race the day before had no effect on where we lined up for this first heat. The big bore cars would go first, they said, followed by the little fellows. The screams of the Porsche drivers could be heard in Le Mans.

Katskee and I had explained to the officials several times that I was driving the 4.4 and Loyal was in the Monza. But we were consistently announced in the reverse order. So I figured, when we were lined up for the start, that the Monza was placed in front of my 4.4. This, I'm sorry to say, was an omen of things to come.

So off we went.

I was running a snappy seventh when I began hearing strange noises from the right rear corner of the car. It was especially noisy in a hard left turn. And it was particularly annoying to hear it while skimming around Meadowdale's famous Monza wall. Of course I recognized the noise as the wheel changing places on the

spline. And it was obvious to me I was going to lose a right rear wheel before the heat was over. My ride around Meadowdale, then, became more intriguing than ever. Now I was trying to find which spot would be the most appropriate and painless to toss a wheel. The possibilities were not what you would call limitless.

My investigation of sites best fitted to throw a wheel was interrupted when I went for another spin, allowing a Lister Corvette to sneak past and making it a sight more easier for me to finish the heat in eighth place instead of seventh. As for the wheel, it was still squealing but hanging on.

During the between-heat inspection of the old beast we noticed a nice big pool of oil under the differential and we found a 2½ inch crack in the differential case. Katskee's mechanic said he really didn't think it would hurt anything!

Then my mechanic, Jack Kretsinger, pulled the pan down and found the filler plug nut perfectly round, making it impossible to add any oil to the differential. From the looks of the puddle, and guessing what had been lost in running the first heat, it appeared we were about a gallon shy going into the second heat.

So we all started charging again and I began experimenting with the Monza wall. It seemed to be unanimous among the drivers that the best way to drive the wall was to get up along the top rail. I was told it was impossible to climb the wall and it was implied that you couldn't lose a car on the wall. The opinion seemed to be that you could almost take your hands off the steering wheel and the car would drive itself around.

Now Katskee and others had told me the thing to do was to hit the wall flat out. Somehow or other I seemed to be a little balloon-footed every time I sailed into the wall, although I was gaining more courage each lap. Just as I was running low on brave pills I finally hit it hard enough to discover it was indeed possible to lose a car on the wall.

While I didn't actually lose the big red animal, I came uncomfortably close and I did some fancy fish-tailing. This can be a trifle nerve-wracking when you're so close to that wire fence at the top. As a matter of fact, I'd been noticing some lettering on the fence and this time I was close enough to read. It said: "Back off, bud, you're close enough."

So I was treating the wall with respect when, on about the fifth lap, I entered it following Katskee and Art Bunker in his yellow Porsche RSK. They were having a sizzling dice and, per my custom on this weekend, I was observing from the rear.

I had just banked onto the wall and looked ahead when who do I see spinning madly from the bottom to the top and back to the bottom but Katskee. He and Bunker came so close to colliding I figured there was yellow spray on Katskee's car, if not paint. And as I came charging around, thoroughly committed to the top lane next to the fence, the Katskee car was spinning back end to, up the face of the wall again. I had a choice of hanging on, holding my breath and respectfully asking for help from above, or, blasting into Katskee broadside. I chose No. 1 as

(Continued on page 86)

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Miseries At Meadowdale

from page 85

my category and it worked. Somehow I managed to squeeze through.

Katskee went into the pits, straightened out the right side of his car which banged into the fence at the top of the wall, replaced a bent wheel and rejoined the party.

Two laps later I came around the back portion of the course and all at once heard another noise — this one in the front of the automobile. I was aware the car had slowed down and my first thought was I had a flat tire. But there was no bumping. The car still seemed to steer, so I started through a little left bend and drove rather gingerly for maybe another quarter of a mile. Then I noticed the crowd running and pointing — at me.

Since I could only think of 11 or 12 things which might be ailing the old bucket, I leaned out and had a look for myself. Shucks, the only thing wrong was the position of the right front wheel. It was jammed up under the fender at a right angle to the front of the car. So I drove on through this turn, trying to find a parking place for the beast so it wouldn't be in anyone's way.

I climbed out and found the right front wheel and drum were completely off. I suspected a broken spindle or hub. I was hardly in the humor to crawl around investigating, the position of the car in relation to the race course being what it was, so I walked back to the pits. So far, it was the most dependable transportation I'd had all day.

Between the second and last heat we brought the beat up 4.4 in with a wrecker. Kretsinger took a look and couldn't find anything broken. He poked around further and found the inner locking nut on the spindle had simply come loose. Just how this happened is for Charlie Chan since it must be driven on with a punch and hammer and then locked. At any rate, nothing was broken. The only real damage was to the broken brake cylinder which was worn half in two from scraping on the road.

Kretsinger went to work and it began to appear we'd get the wheel back on in time for the third heat. We'd be pretty shy on brakes, of course, but there's the gear box and, as a last resort, a man can always drag his feet.

While mechanics and assorted volunteer assistants worked feverishly, I took a stroll up and down the pit lane to check on what I laughingly referred to as my opposition. Upon returning I found Katskee and his mechanic — obviously thinking we weren't going to get the 4.4 ready for the final heat — had cannibalized my spark plugs and two rear wheels.

I tried to get a slight delay in the race but all of a sudden it was necessary to get the show on the road to accommodate a Chicago radio station, so all the cars were hustled out on the grid—except my pore old 4.4. We were busy rounding up some used spark plugs (and I do mean used) and a couple of rear wheels. Kretsinger at least was getting the wounded front wheel back on.

The race had gone about four laps when we finally got all the wheels on and were ready to go. Only one thing kept me from taking off after the pack. The car wouldn't start. Then someone recalled that the battery on Katskee's Monza had gone down, so he switched with the 4.4. So now we had a flat battery in addition to a leaking differential, no front brakes, a front wheel which it was hoped would stay on, and anemic spark plugs. The car started with a push but only because, when the batteries were switched, someone unthinkingly hooked it up. We were mighty grateful. After all, they could have left it on the pit floor.

I drove down to the start-finish line, obtained permission to start, and drove out on the course, gingerly testing what brakes were left. I found I had some but took things easy, keeping out of the way of the fast cars.

Upon reaching the Monza wall I flipped my last brave pill down my throat and hit it with enough go to stay up near the rail. I skimmed off the bank and flattened out for a nice controlled charge down the straight when I saw the starter wildly waving the black flag at me. Naturally I figured I was going to throw a shoe again, so I eased around the course and pulled into my pits. I never was so surprised in my life when they jacked up the rear of the car. I asked what the hell was going on and was informed Katskee's bent wheel had been put on my car in the confused shuffle.

So I got another left rear wheel with not much rubber and took off again, cruising warily and slowly. When the car got to 4000 rpms the whole business shook like a dog which had been on a week's diet of peach seeds. It took me a while to realize that this was not square wheels, as it felt, but simply the old spark plugs in that six cylinder motor, shaking it so violently it shimmied the whole car.

I made this lap without anything unusual happening, except for the long list of things which no longer were considered unusual, only to find the black flag on me again. So I slowed down, which meant I all but stopped dead, supposing something else was falling off. I crept around the course and back to the pits behind the start-finish line.

I shut off the engine and Bill Smythe, USAC sports car director and chief steward of this race, started a leisurely conversation with me, saying first that he understood we had done some welding on the car.

No, I assured him, we hadn't done any welding on the car. That was about the only thing we hadn't done. But if he'd like for us to weld something, I was dead certain we could find something to weld.

We continued to pass the time of day, discussing various technical aspects about pulling into and out of pits without permission, after being black-flagged, and I explained I thought I had been called in by my pit crew. They had been vigorously motioning me in the first time and I naturally supposed they had asked the official to wave his black flag.

No, the officials had done it on their own, Smythe explained, and they were a little hurt that permission hadn't been sought to go forth again. This discussion was all very amicable, but the other cars weren't waiting until we finished our chitchat. Finally I asked if they wanted me to race it or park it and they said I could go ahead if I wanted to and I thanked them and said that's why I came and drove on out . . . in my tired, sick, ancient Ferrari, by now about 10 laps behind.

I managed to have two or three thrilling duels with a Sprite, getting past him in good shape, and then tackled bigger game – a TR3. I've never seen a TR3 that seemed to be going quite as fast as this one.

As the race wore on I chugged past one car and then another sitting along the road. A few laps more and my pit holds up a sign: "John, stay in. You are 8th." Somehow this didn't make sense, because I could count at least 12 cars as they went past and I knew they were ahead of me, but then nothing was making sense any more. So I tootled along, waving at the flagmen and the little boys and girls.

I picked up two positions when Rodriguez flipped his Porsche and Bunker, on about the last lap, did a headstand in the other RSK. By picking up two positions I mean instead of being 12th and last I was 10th and last.

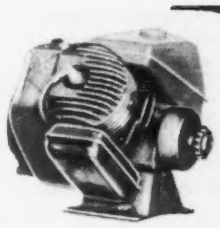
Ruby buzzed me in the Maser, then smacked the wall and blew a tire. He was just limping back to his pits but damned if it didn't take me nearly a lap to get past him.

But I finished . . . 10th in the heat and 10th overall for the three heats. The old bucket made it. And, amazingly enough, I made $245 for Katskee. It occurred to me later that, as dear to my heart as a Ferrari racing car is, I wouldn't have carried this pig home for $245.

And so my miseries came to an end. If there was any consolation for my weekend, wherein the fickle finger of frustration pointed at me constantly, it was the great service I rendered to fellow Ferrari drivers. They can go forth now, cheerful and unafraid in the knowledge that they can't be the first to be beaten by two TR3s and a Sprite.

Oh, by the way, I am the possessor of 83⅔ USAC Sports Car racing points. I will gladly trade these, even up, for green stamps.

—jk and frk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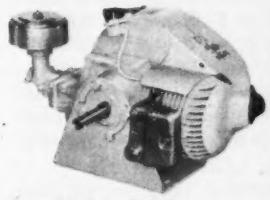
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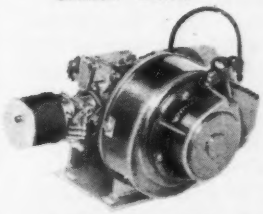
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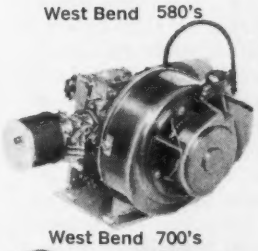
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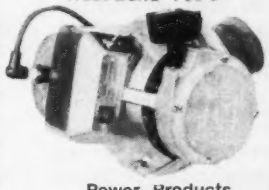
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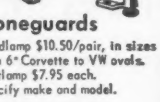

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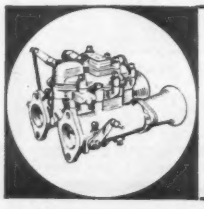

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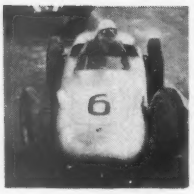

Formula 2 Porsche

from page 69

pretty good at first, but the quality is only really tested during a race. Consequently the experimental car was run in the 1000 Kilometer race—with the above mentioned results.

"The present opinion of the Porsche testing section is, then, that the disc brakes tried and proven in England are not yet up to the standard of our own drum brakes. Therefore, for the time being at any rate, they will not be used on our production cars, unless our own version of the disc brake produces better results than the British production units.

"A British-made disc assembly weighs, for example, 15 pounds more per wheel than our drum brakes, which adds undesirable unsprung weight as well as 60 pounds to the weight of the whole car. Another British make only weighs 8.8 pounds more per wheel, or 35.2 pounds more overall, but this the Porsche engineers also reject as too much. To this is added the difficulty of supplying a really effective parking brake, a problem which, so far as we know, has not been completely solved by an existing disc brake. As a result of trials made up to this date, we are still very far from introducing disc brakes on Porsche production cars."

On this tiny *monoposto* the Ate drum brakes have a far better time of it than on the Porsche sports cars, because they're out in the open, and are supplied with scoops. The race car has also been lightened by narrowing the frame, plus fitting a neat 65-pound body, and using more magnesium —for the brake drums and ribbed backing plates. Excepting the six-speed gearbox, the only other major deviation from the standard RSK is the entirely new rear suspension. This new device did make its first bow on one works Spyder at Sebring in 1959 (Its effect is clearly shown in comparative pictures on page 22 of SCI, June, 1959.—Ed.).

The aim of the Porsche technicians was multiple. They wanted to minimize changes of camber and tread with wheel deflection, and to induce toe-in of the outer rear wheel in a corner to give more "bite." The former had been approached but not satisfactorily solved by the current low-pivot swing axle layout, while the latter would permit an increase in overall cornering power without harming the balance of the machine. All these are accomplished by a layout which is unique but so logical that it makes one wonder why it's never been tried before.

By guiding the wheels with two wishbones, their pivots angled and their planes nearly parallel, the effect given is that of an angled swing arm, like that of the Corvair or Fiat 600, but with a much longer effective swing radius—on the order of ten feet. Camber change is maintained by using a pair of wishbones, while tread changes are kept down by making the upper wishbone shorter than the lower. The top wishbone is a simple two-armed member; the lower one is made up of one vee-shaped arm and a tubular trailing arm. The frame ends of all these members have screw adjustments for "chassis tuning."

This new rear end can be held responsible for the great accuracy of this new Porsche's steering and for its very stable feel over uneven surfaces. There's none of the swing axle's usual "walking" effect. The car Dr. Hild so kindly "lent" me was changed in many details from the prototype that first raced at Monte Carlo. Its lines had been spruced up by restricting the air inlets to the oil cooler and carburetors, and by moving the rear view mirrors from the front suspension mounts to the sides of the curved windshield. Since Germany's representatives firmly supported the 1½-liter Formula beginning in 1961, it's heartening that her constructors are already so far advanced on hardware as to give material support. This little car is already serious competition. —*huw*

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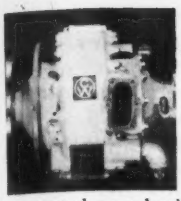

Tomorrow Is Here

from page 57

centrated on a basic unit with a swept volume of 15 cubic inches, a module that could be useful in NSU's burgeoning series of small production automobiles. As mentioned in European Newsletter last month, their experimental engine weighs about 35 pounds and develops slightly more than 40 horsepower at 8000 rpm, a speed only midway along its useful rpm range. It is said of this NSU engine that operation is so smooth a glass of water, placed atop a running unit, will not show a ripple in its surface.

NSU's licensing agreement with Curtiss-Wright, estimated to cost C-W $400 thousand annually, gives the latter firm exclusive rights to worldwide aircraft use of the engine and exclusive rights for all other purposes in the United States, Canada and Mexico. Curtiss-Wright may also export vehicles made here that use the engine. Reciprocally, NSU may ship the engines into America if they're installed in their automobiles, motorcycles or scooters.

Curtiss-Wright's version of the engine has been running since late 1958 on the test bed and in experimental installations like a portable water pump. Their basic unit develops about 100 bhp and, when made with a cast iron casing, weighs roughly 100 pounds. Comparing it with the NSU edition, the American version would seem to have a swept volume of about 35 cubic inches. It delivers this power on moderate-octane automotive gasoline as specific fuel consumptions of .45 pound/bhp-hour and less — an extremely economical rate. At this stage of development, at least, this engine doesn't seem to know what preignition or detonation are. This is in part due to very low spot temperatures — said not to exceed 300°F — that prevail within the engine. As the explanation in this issue shows, the rotor is bathed in cool fuel-air mixture just after it has released a pocket of exhaust gasses. As a matter of interest, one prototype engine runs on an S.U. carburetor.

No official statement of the rpm used by the Curtiss-Wright engine has been made, but it can probably run up to 15,000 rpm at least. Spokesmen endow it with an idle speed down in the 400 rpm area, and with extremely responsive acceleration, thanks to the utter absence of reciprocating masses. Very smooth, flat power curves are characteristic of the design. So flexible does it promise to be, in fact, that the prospect of using it in automobiles *with no transmission* is being actively investigated.

Extraction of additional power is a process that has just been started. Easy package increases can be effected by "stacking" two or more engines together along a single shaft. C-W's basic module could, on this basis, be part of an engine developing from 100 to 400 horsepower. More than four units could be placed in line, but practical considerations have prevented this thus far. By supercharging, as is customary for aircraft use, nearer 175 bhp can be drawn from a single engine. Curtiss-Wright have already built a centrifugally-blown aircraft powerplant, using dual ignition, that's rated at 700 bhp.

At C-W's Wright Aeronautical Division at Wood-Ridge, New Jersey two other basic engine sizes are being developed. One, much larger, would deliver 750 horsepower in a single module and up to 3000 bhp in a clump of four, or from 1250 to 5000 horses in supercharged form. The smaller size, which would have less displacement than NSU's basic engine, will be adaptable to from 5 to 100 horsepower.

Specific claims haven't been made, but durability is said to be above average. In view of the logic and simplicity of the design, this seems justified. Still the most secret element of the design is the method of sealing the sliding joints between the sides of the rotor and the two side plates, though the system is known to be sensitive to the engine's internal pressures. Components in the sealing systems would, like valves and piston rings today, probably be most susceptible to deterioration. Costs aren't being discussed either, yet. Basic manufacture seems to be simple, however, and materials aren't exotic, so production versions should bear a very reasonable price tag. Curtiss-Wright expects to have an industrial version of their pilot engine in production at their New Jersey factory before the end of 1960, so there's not long to wait. Tomorrow is here. It came on November 23rd, 1959.

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The Golden Plate

from page 61

being an inch or two narrower than a Palermo streetcar's, Vincenzo's essay in space travel ended abruptly.

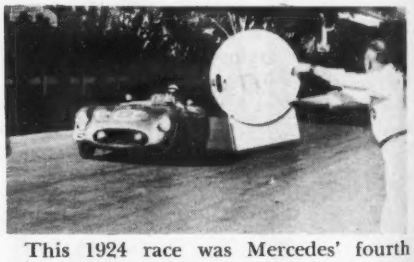
No doubt this incident nourished Florio's prejudice against the *Giro di Sicilia* course, to which, under pressure from various authorities, he'd unwillingly consented to switch the Targa Florio in 1912. It stayed in the relatively tame environment of the island's coastal fringe, devoid of mountains and only meagerly inventoried with blind hairpins, for three years, through 1912, '13, '14; then, right after WW1, the race reverted to its birthplace in the shadow of the hulking Madonie mountain and its litter of lesser peaks.

There were three overlapping Madonie circuits, the shortest of which, 44.6 miles around, was splintered off the other two in 1932 and is still in use today. The long course, a sprawling 92-miler, launched the series in '06, had a six-year innings up to and including 1911, made a brief comeback in 1931, then passed into history. The medium Madonie circuit, dominated by the Norman-built township of Polizzi Generosa, 3000 feet above sea level, was the setting for twelve consecutive Targa Florios, 1919-'30, and measured 67-miles per lap. All three courses shared a common finishing straight, five miles long and dead level, flanking the Tyrrhenian seaboard east of Palermo, the Sicilian capital. Inland, without letup, the road writhed and undulated like a demented serpent, alternately clambering into the clouds and plumetting to valley floors, clinging to precarious mountain ledges on the edge of precipices, transiently trading solitude for the bustle of primitive communities in such outposts as Calvaturo, Castellana, Petralia, Castelbuono, Collesano.

The surviving Madonie course has 898 corners per lap, compared with 1500-plus and around 2200 for the medium and long ones respectively. For man and machine both, no other test ever stood comparison with the Targa Florio. Apart from the shore straight beyond Campofelice, most cars didn't get into top gear anywhere. Earlier, in an era of cruder chassis design, partial seizure of the steering swivels was a common hazard of the Madonies. This island rumpus, indeed, was a killer in everything but statistical fact; only two drivers, I believe, ever lost their lives in the Targa Florio, Masetti in 1926 and Aloatti in '34, a toll vindicating Florio's assertion that his race was too dangerous to be lethal.

Factors favoring personal survival were the rigorous speed limits imposed by the terrain and the low incidence of overtaking manoeuvers. Fastest winning average of the series' heroic age between the wars (excepting an emasculated version staged in Favorita Park, Palermo, for racing voiturettes) was Nuvolari's 49.27 mph on an Alfa Romeo in 1932. In the classic Madonie setting a race speed of 50 per hour wasn't broken until 1953, when Magioli (3-litre Lancia) turned 50.09 for eight laps of the present 44.6 mile circuit. A Madonie based Targa Florio has yet to be run at sixty overall, the lap record currently standing at 63.42 mph (Moss, DBR1/300 Aston Martin, 1958). Partly to spread the action out for the public's benefit, and partly because the roads in this region are too narrow and twisty to contain the boil-over from a mass start or its Le Mans approximation, interval send-offs have always been the Targa Florio rule: hence the relative rarity of overtakes. One year, when the field was sparser than usual, spectators had two-hour intervals to while away between the tailenders' passing the leaders' reappearance.

But to compensate for the intermittence of the drama, there sometimes were splendid opportunities for audience participation. It was just a question of being in the right place at the right time, e.g., around the pits at the climax of the great Mercedes *vs.* Alfa battle in 1924. This was something that would have warmed Mr. Cecil B. de Mille's heart. Crowd discipline, which was always in inverse ratio to the armed strength used to enforce it, broke down completely when one of Mercedes' team cars pitted for servicing operations that could vitally affect the outcome of the race. In seconds the Merc depot was a milling, yelling, gesticulating ant heap of unauthorized humanity. So the attendant platoons of *caribinieri*, having failed to prevent the break-in, switched to bouncers' technique, ejecting the insurgents with a thoroughness that left scarcely a nose unbloodied. But now, finding themselves as badly hampered by surplus soldiery as they'd previously been by unwanted civilians, the Mercedes personnel turned on their rescuers and threw *them* out, tossing their rifles after them.



This 1924 race was Mercedes' fourth Targa bid — they'd made their postwar comeback to European racing in the 1921 event — and it brought the Stuttgart team its first Sicilian victory; winner was Christian Werner at 41.02 mph for five laps of the medium Madonie course. A couple of years earlier, it's true, an Italian amateur, Count Guilio Masetti, had won at the wheel of his privately entered Merc, but this had only underscored the failure of the official six-man factory team comprising Lautenschlager, Salzer, Sailer, Werner, Minoia and Scheef. Incidentally, two names that recur in the early annals of the Targa Florio are Alfred Neubauer and Enzo Ferrari. Best placement by Neubauer, an undistinguished driver, was fifteenth on a Mercedes in 1924; he was 31 years older and fourteen inches further around the belly when he next visited the Madonie theater in 1955 to share, in his *rennleiter* capacity, the sensational Moss/Collins success. Ferrari chauffeured an Alfa Romeo into second place in 1920, twenty-eight years before a V12 of his own make carried Clemente Biondetti and Prince Igor

Troubetskoy to victory in the first post-WW2 Targa Florio, 1948. Apropos, the first car to bear the Ferrari nameplate raced for the Targa in 1919.

May, the traditional Targa Florio month (occasionally varied to late fall or early winter), is usually a season of blistering temperatures in Sicily. Even habituated Italians have been known to collapse under the heat in midrace. Minoia's riding mechanic, rissoled into unconsciousness in the 1924 event, proved unresponsive to first-aid tuneups and had to quit altogether. Fiat's star driver, Pietro Bordino, stepped overboard at the pits the same day and fell flat on his face, senseless. Anywhere but in the Targa Florio, this defection would have written *finis* to a hitherto spirited challenge to the Mercedes team, because no spare driver had been bracketed with Bordino. But a mere formality like a name on an entry blank, or rather the absence of one, couldn't be allowed to spike the Fiat gun. Felice Nazzaro, veteran racing driver and two-time Targa winner in the series' prewar infancy, happened to be alongside as Bordino folded. Raised in the anything-goes spirit with which Florio had always infused his race, Nazzaro jumped into the vacant cockpit and pellmelled away up the twisting slopes towards Cerda.

As reluctant as I am to spoil the story, it must be admitted the old boy blew the car up within five miles and had to ditch it.

Another story it's a shame to spoil is the myth that robber barons used force of arms to resist the Targa Florio's invasion of their mountain territory, sniping at pioneer competitors as they chugged and thrashed over the lonely Madonie passes. This simply never happened. What did happen is that Florio, while reconnoitering the original circuit with a retinue in 1905, was intercepted and courteously quizzed about his plans by the number one outlaw of the region. When the project was detailed to him (like most Sicilians at that time, he'd never seen a car), the bandit volunteered assurances of noninterference, and the undertaking was moreover for free. Whether Florio trusted him fully seems doubtful, judging by the fact that he persuaded the authorities to draft 5000 *caribinieri* to see fair play during the inaugural race. Troops, in fact, outnumbered spectators in 1906. It naturally was never any part of the soldiers' duties to act as marshals. The Targa Florio, throughout its long and checkered career, has dispensed with a marshalling service, outside of the pit area. To people a Madonie-length lap with qualified flagmen would be impracticable, and imagination boggles at the idea of stationing an unqualified signaller around a blind turn on the lip of an abyss.

Something else that drivers never got for their entry fee was shunt protection in any such form as straw bales on corners. If you wanted to run out of road, you could go ahead, and welcome. There were plenty of places where such exits could be made without necessarily endangering life and limb; and sooner or later, assuming you couldn't get your car back on the road unaided, the chances are you would be spotted and rescued by willing and mus-

(Continued on page 92)

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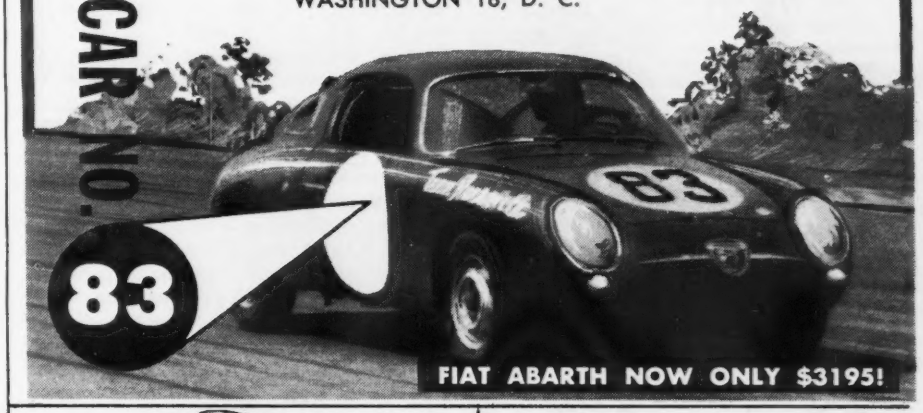

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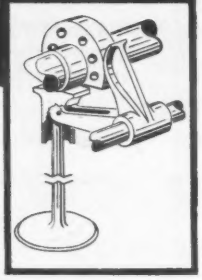

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The Golden Plate

from page 91

cular peasantry, plus mulepower if necessary. Rules forbidding drivers to accept outside assistance never could have been enforced, so they didn't make any. In the rain-sodden Targa Florio of 1919, run later in the year than ever before or since (late November), the winner, André Boillot, spun his Peugeot off seven times, overturning it twice, before finally homing at record speed to clinch the first French win ever. That was the day Alberto Ascari Sr., father of the latterday world champion, toppled his Fiat into a ravine between Calvaturo and Polizzi on the first lap and was posted as lost until a search party traced him by his skid marks after the race and winkled him out.

Targa statistics give Boillot's 1919 average as 34.19 mph, but it isn't exactly clear which of his two finishes this was calculated from. His first finish was slightly delayed when, fifteen yards from the line, he overbraked on the rising curve at the pit area, spun three times, dove off the road and demolished a small grandstand. Driver and mechanic were thrown out in the ruckus and a score of spectators, scenting a chance for audience participation, attempted to manhandle the Peugeot over the line without bothering to reimplace the crew. In this, though, they were thwarted by a spoilsport minority who'd read somewnere that such a proceeding would be contrary to something or other. So Boillot and partner, too far gone in combat fatigue to hoist themselves back aboard, were lifted in bodily by eager fans. Just sufficiently *compos* in the *mentis* to notice the car was facing the way it had come, rather than the way it was supposed to be going. Boillot notched reverse and *backed* across the timing strip . . . only to be told this too was unlawful in the eyes of authority. It wasn't, of course, but by now the Frenchmen were past arguing. Hardly able to see out through the masks of mud they'd been accumulating for 268 fenderless miles, they retraced their wheeltracks to the mouth of the pit area, made a shaky U-turn and finally bisected the line in conventional front-first order. Then Boillot passed out cold.

He needn't have hurried, as it transpired, because the second-up car, an Itala driven by Moriondo, took half an hour longer than the Peugeot to complete the distance. In the absence of anything as complex as a chain of timing and observation stations, interlinked by 'phone—for which facilities didn't exist in this benighted region anyway—a Targa driver had no way of knowing how the competition was making out; so he could only assume the worst and go flat out from start to finish. These tactics, particularly in the early days when tires were undersectioned and insecurely wedded to rims, were apt to be tough on rubber. Crews were known to carry as many as eight spare covers, forming a swaying turret on a platform back of the cockpit. At that, there were instances of a car finishing on four flats.

Road surfaces, varying from fair to atrocious, according to the state of the weather and other factors, naturally played their part in the tire problem. Hazards under this head could be classified as forseeable and unforseeable. In the latter class you could include the whim that prompted some unidentified sportsman to plant a row of jagged boulders across the course in the Polizzi neighborhood one time, just around a blind corner; you could outflank them, sure—either by smacking the perpendicular rock face on the left or popping over a precipice on the right.

Sicilian style road repairs were good for a hollow laugh too. A cobbling job they did near Campofelice, following a local washaway on the eve of the 1930 Targa, had consequences that Achille Varzi was to remember for many a day. His Alfa hit the bogged section at seventy, bottoming all four springs to the buffers and breaking the spare wheel mounting. Shifting in its slot, preparatory to going overboard, the wheel chafed a puncture in the gas tank. The payoff came on the last lap, when Varzi was in hot and hairy pursuit of the leader, Bugatti's number one, Louis Chiron. Taking a hint from fuel starvation symptoms (this was the first he'd known about the leak) Varzi stopped for an unscheduled fillup at one of Alfa's *pieds-à-terre* out on the circuit. His riding mechanic snatched a can of gas and tried to sluice it in while the car was on the move. The overspill splattered the hot end of the exhaust pipe and caught fire. Then the blaze spread over the tail of the car. Obedient to Varzi's shouted order, the mechanic vaulted into the cockpit and slammed the filler shut. For two flat-out miles, while Varzi flattened his chest against the steering wheel in efforts to stay out of ignition range, his companion pounded the flames with a seat cushion. As the last flicker ebbed and died he subsided in an exhausted heap into the footwell.

By one of the slimmest margins on record, 1 minute 48.4 seconds, Achille Varzi headed Chiron to win this coming-of-age Targa Florio, twenty-first in the series. In doing so he broke a monopoly of Bugatti victories that had spanned five consecutive years, and laid the foundation for a spell of Alfa Romeo supremacy that would last another six. He later made another contribution to the Milan firm's unique record of Madonie triumphs, copping a second Targa in 1934, the year when every single finisher was on Alfa iron. With Felice Nazzaro, Guilio Masetti, Meo Constantini, Albert Divo, Tazio Nuvolari and Umberto Maglioli, he shared the honorable distinction of winning twice in the Madonie country. Nobody ever won three times.

If I've failed to convey the idea that the Targa Florio was a male *milieu*, I've failed to convey an idea. It may therefore come as a surprise that the story has a heroine. Elizabeth Junek, from Prague. Entrusted with her husband's Bugatti, Elizabeth crashed and retired the first year she drove (1927); then led the entire race at one stage the following spring, against the pick of the Bug and Alfa professionals. She finally placed fifth, after a stone had holed her radiator. Not content with driving more circuit familiarization laps than

any other Targa contender before or since, Mme. Junek also *walked* around the 67 mile course during the 1928 training period.

Down the years the Targa Florio has rung numerous changes on the "formula" theme. In the beginning it was strictly for stock cars, but Florio's definition of stock (ten of a kind in production) made the party so depressingly exclusive he soon relented and opted for what would later be known as *formule libre*. Throughout the heyday of the series, from 1919 until the middle thirties, there was virtually no brake on specificational enterprise, a freedom that stuck constructors with the onus of deciding what sort of cars were best suited to a contest that was without counterpart anywhere in the world. Some of them had trouble making up their minds, witness the richly assorted equipment chosen by Mercedes in 1922—two modified 1914 Grand Prix cars, two supercharged 1½ litres, two big blown sixes of 105 by 140 mm bore and stroke. In general, heavy metal stood up to the pounding best, but it was less manoeuverable in the tortuous Madonie topography; also, of course, it was tougher on tires. According to one school of historians, incidentally, the blown Mercs that ran in the 1921 Targa were the first supercharged cars ever seen in European competition. Certainly this event was the German firm's first race *mit kompressor*.

The separate Targa Florio for voiturettes, which started in 1907 and continued fitfully until 1928, produced technical novelties and nightmares of its own. Pre-WW1, the voiturette formula restricted cylinder bore to 100 millimeters but didn't say anything about stroke. The result was a one-way growth that didn't stop until strokes reached 250 mm. These engines, as W. F. Bradley recalls in his book *Targa Florio*, were "of such a height that drivers could not see over them and had to get their view of the road either to left or right." One of these rangy plants, the Verdet, seemed to owe its inspiration to a kitchen colander, and had a six-valve head and dual spark plugs.

Coinheritor of a massive fortune—his family were among Sicily's biggest landowners, winegrowers and shipbuilders—Vincenzo Florio was well equipped to indulge a born yen for sport and adventure. In his youth he raced bicycles, then motorcycles, finally cars, dabbled in ballooning and yachting. His debut in automobile speedwork was made in hillclimbs as early as 1902; from there, a couple of years later, he graduated to circuit racing at Brescia, competing for his own Coppa Florio on a 60 hp Mercedes and only missing it by a couple of places. In 1903 he'd entered himself for the Paris-Madrid, which was to become notorious as the Race to Death; but his elder brother, who was also his guardian, tricked him into missing the lineup by having him marooned *pro tem* on a Mediterranean island. For consolation, after he'd come of age and was therefore no longer subject to brotherly tutelage, he was invited onto the Mercedes team for the first French Grand Prix ever run around a closed circuit—the 1906 dice at Le Mans. He accepted, retaining his

(Continued on page 98)

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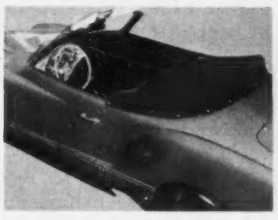

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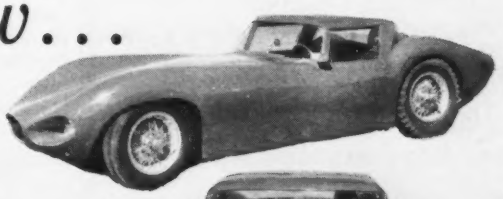

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Brazen Hustler

from page 67

wall thickness is no help under these circumstances.

By building the head and block in one unit, Taylor eliminates the potentially troublesome head gasket, and also any need at all for increase in wall thickness at the top of the piston's travel.

But instead of casting the cylinder head in unit with the cylinder block (a practice followed by Bugatti, Miller, and Offenhauser), Taylor welds his unitized structure out of many steel stampings. Being steel and being stampings, they need be only 0.10 inch thick instead of three times that, making the heat travel only one-third as far. Daimler-Benz has done this too, for many years, the M 196 series engines being only the latest of this type.

With financial and technical assistance from T. C. Tyce and use of the Tyce Engineering Corporation's furnace brazing equipment, the new engine has been designed with production in mind. Instead of being hand-welded as on the Mercedes-Benz, the entire assembly is brazed simultaneously. As the parts are assembled on a jig, copper foil is placed at each joint. The copper melts in the 2000°F. furnace losing its surface tension and flowing all over the interior. The result is an intermolecular bond joining the once-separate stampings, plus the dividend of internal copper plating throughout. Old blocks cut apart after much use show no signs of corrosion.

The individual stampings reflect the variety of duties performed by a cylinder block and head. To keep wall thickness uniform after stamping, sharply contoured parts go through two stamping stages. The first produces only fairly large radii while the second one in the coining dies provides the final shape with its sharper corners.

The assembly is based on four cast-steel cylinder hold-down flanges. They allow for expansion during brazing, and have a 1/32 inch gap between each other, enough to clear but close enough so they can share hold-down studs. Into these, four 0.063-inch thick cylinder barrels of 4130 steel are inserted. Stamped combustion chambers which cover them sprout spark plug tubes (threaded at the end) and intake and exhaust ports. The latter are made in halves, the rather large joining flanges remaining. They also include provision for inserting valve guides later. Over all this is dropped the water jacket, a deep U-shaped stamping with four holes in its bottom, one per cylinder. Two stiffeners run the length of its sides, one serving as a water gallery with four towers carrying the coolant close to the exhaust valve guides and the spark plug sockets.

Topping off the water jacket is a shallow U-shaped pan which contains the camshafts. Hat-sections across the pan stiffen it and provide support for the two cams. Endplates for the head/block complete the water jacket rather neatly, having grooves around their edges which accept copper wire before being brazed to the jacket sides.

Not one to be carried away by too much of a good thing, Taylor reverts to the racing world's popular cast aluminum for his barrel-type crankcase. Here rigidity is the major concern and metals with the highest strength/weight ratio and the lowest density (within reason) are preferred. A new bell-bottomed case is now being made to increase rigidity over that of the crankcase shown in the photos.

All but one of the five main bearings fit within two-piece circular carriers whose outer diameters are larger than that of the crank itself. After they are fastened onto the shaft, the latter is inserted into the crankcase from the rear.

The reason the ductile iron crankshaft is hollow is a familiar one, it gives the tortuously shaped casting reasonably constant wall thickness. This reduces stresses and makes the shaft stronger even though there's less material in it. Another advantage is vastly increased torsional stiffness for the weight. Taylor made some measurements on a prototype under test and found 3 to 4 degrees of angular whip at the flywheel. Large bearing diameters also help, since the bearing journals tend to be the skinniest spots on the crank. The T-T has 2.30 inch mains, 1.25 wide. That diameter is almost equal to the smallest stroke offered, so the bearing overlap is indeed generous.

Though the major components of his engine are specially built and therefore quite expensive, Taylor has sought to pare prices without loss of quality by using common domestically manufactured parts for many of the smaller items. These include piston rings, wrist-pins, rods, timing gear, timing chain, distributor, valve springs and guides, bearings and other parts as well.

Taylor's standard pistons give a 12 to one compression ratio. Fourteen to one is available too. Experimental engines have been run at 20 to one. In all engines there has been very little spark plug trouble, testimony to the good cooling. In the 12 to one model, which cranks over 200 psi of compression, Taylor has advanced the spark so far that it slowed the engine without pinging.

Fascinating as it is in specification and detail, the engine remains to be proved in competition. If it turns out as well as its makers claim, the price should make Formula One as popular and nearly as cheap as Formula Junior.

The first car installation will be a two-liter which is going into Gordon and James Boxberger's Lotus XI "Le Mans" but the builders are quick to point out that far less esoteric machinery such as Austin-Healey's, MG's or Triumphs can be fitted with one also. They recommend the Corvette four-speed gearbox for the two larger engines but feel that the original equipment should be satisfactory for the smallest. Turning 6500, they should be happy too with standard final drive ratios. Twice the horsepower with 300 pounds or so less weight to move should really make an old MG look new. Time will tell.

—sfw

Fiat 1200TV Roadster

from page 64

natural to use than might appear at a glance. Heel-and-toe downshifting is a cinch with the well-placed organ-type accelerator. Response to the throttle is consistent but not instant, there being some vagueness in the control linkage. Depressing the brake pedal brings strong and even action at once, without fade under fast touring conditions.

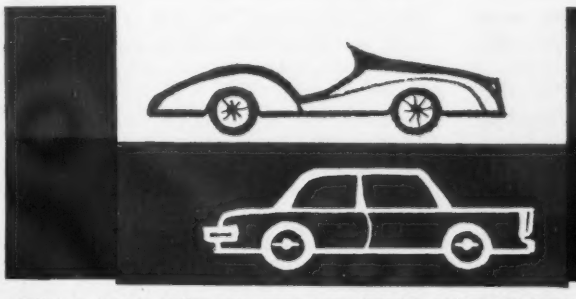
Gradually developed from Fiat's long-lived 1100, the 1200TV engine delivers power that's adequate but not startling. Its pushrod-operated overhead valves give the unit a "fussy" sound and, as standard, place limits on the usable rpm—which is probably just as well, since the engine revs up freely if not with real eagerness. It's an easy starter, both warm and cold, but it definitely refuses to run smoothly until a decent coolant temperature has been reached. As in most modern European four-cylinder cars, the engine is very flexibly mounted to reduce transmission of vibration to the chassis which, as here, is usually a platform or integral structure very susceptible to drumming caused by such vibration. The mounting is moderately successful in this case, tremors still creeping through at certain rpm to cause the softly-mounted rear view mirror to quiver into a blur.

One major drawback of fitting very soft engine mounts is that they can allow the engine to tilt back and forth very freely under the influence of torque reaction—when the clutch is engaged, gears shifted, reverse gear used, etc. This causes a certain lag in the car's response to the clutch and throttle, which is evident in the 1200TV

The synchromesh on the top three ratios of the four-speed box is strong, allowing fairly fast shifts without a trace of clashing. Spring-loaded to the right of the high and narrow shift pattern, the lever is easily reached and free of any dashboard protrusions. Top and third gear ratios are nicely planned and spaced, but second is a long way below third, very close to first. In effect the 1200TV has an all-synchro three-speed transmission with an auxiliary gear to prevent excessive clutch slip when starting.

Good aerodynamics (coupled with razor-edge tuning by the expert mechanics at the home of this car: Roosevelt Automobile Company) pay off in the remarkably low fuel consumption during our test of 27.7 miles per gallon. Most owners would probably find their mileage ranging between 27 and 32 mpg—very good figures for a car as sporting in behavior as this one. Its performance is nothing spectacular, but it does show a surprising inclination to climb quickly to easy cruising speeds in the middle seventies, which can be maintained without apparent strain. On a level stretch it will indicate 99-100 mph on the fast speedometer, equivalent to 91-92 actual mph.

Other features that make the Roadster very habitable for long trips are a flat and steady—though sometimes pitching—ride, a spacious trunk with a wide, flat floor over the concealed spare tire, and a handy map light under the dash. Selling for $2812 at Baltimore port of entry, its main attractions in its price class are stunning looks, very good detail work and agile handling—aided by that surprising gas mileage. If you're thinking of waiting for that twin-cam 1500, remember that it will be price-tagged at $3730. Most buyers will be perfectly happy with the all-around ability of the Roadster named 1200TV. *—SCI*



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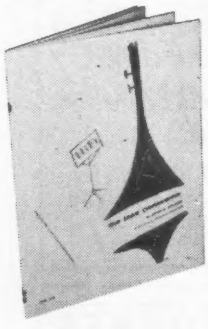

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Riverside Recap

from page 70

Finally the flag fell again. Richie Ginther, on the pole by virtue of his blistering qualification time of 2:06.97 in the latest 4.1 Ferrari was away first, with Hill in the ex-factory 3-liter hard on his heels. Stirling Moss in a factory 4.2 Aston-Martin was third. All three began to pull rapidly away from the rest of the pack in what could have been a parade but wasn't. It was, rather, a private race, run more like a ten lapper than the 200 mile enduro which it was supposed to be. Only once was Richie headed when on laps ten and eleven, Hill called on his experience to slide in under Ginther on one of the turns. Richie then turned on all the horses provided by the extra 1100 cc in the bigger car and took back his lead on the mile-long back stretch. Moss, trying desperately to stay with the two Ferraris in the Aston went into a hairy, dust-throwing slide at turn 8, recovered and went on, dropping back only a few yards in the process. Slowly, by dint of pushing deep into the turns he regained the lost yards and started to push Hill, at one point almost riding Phil's rear deck. Hill would pull out in the straights and Stirling would sneak back again in the twisting north section and in the tricky banked south turn. But it was a last-ditch effort. Oil pressure in the big Aston was dropping steadily and the heat was rising in direct proportion. Spatters of oil seeped out from under the hood, going up the windshield. The Aston was apparently geared for a tighter course and the horrendously long, slightly downhill back straight was too much for the big six to take indefinitely. Finally on the 23rd lap Moss turned his hottest lap at 2:09, a second under his qualifying time. It was too much—three laps later the oil pressure dropped out of sight and Stirling was forced to pull in and park it for the duration.

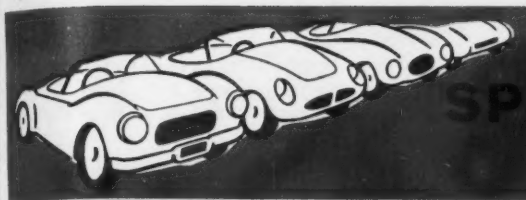
Far out ahead of everybody else, a lap ahead of Lloyd Ruby, running third in the Micro-Lube 4.5 Maserati, Hill and Ginther continued their bumper-to-bumper chase. Then suddenly Hill found himself all alone. Coming down the front stretch nose-to-tail the two cars shot by the start-finish line. Richie snapped to the right, pulled out, stopped the car and clambered out. He too was a victim of a zeroed oil pressure guage.

The Ginther-Hill-Moss battle wasn't the only bit of dramatic business. Back a few miles a lean, hawk-nosed American-Englishman was playing fox, using his knowledge of his car, driving with his head, not his feet. Four nearly identical Porsche RSK's had started in the race, qualifying in a bunch. These were driven by Ken Miles, Ricardo Rodriguez, Jack McAfee and Sam Weiss, in that order with Miles and Rodriguez only one *one-hundredth* of a second apart at 2:12.84 and 2:12.85 respectively with McAfee and Weiss only a second slower.

Ricardo started going from the start, really pushing it. McAfee was next and then came Weiss with Miles bringing up the rear but never out of sight. Either Ricardo was pulling more gear or he forgot there was such a thing as a rev counter; he stretched his long lead even further, at one point threatening Ruby in the big Maser. Things stayed this way up to the halfway point when Miles, still playing things cool, moved up and took Weiss in one long, smooth pass. Then he moved in on McAfee, hustling and harassing until he got by. This was too much for Jack and he shoved his foot down hard, regaining his position over Miles but only just. Then he began to stretch it. It was just that little bit too much; some good Stuttgart metal let go and Jack was a spectator. At almost the same time Ricardo coasted in with the car in neutral, his overpushed engine heat-frozen solidly. The wily Miles was free and clear. It was all quite simple—a case of sheer self-discipline. Ken knew to the single revolution how much his car would take, how much and for how long it was safe to go over that limit. He drove strictly by the tach, trusting that others would make just one mistake. They did. Ricardo pushed too long and too soon, McAfee pushed too hard and just a shade too long and Weiss didn't push quite enough. Such iron self-control is probably more fatiguing than sheer flat-out driving—a constant, never-ending process of saying to one's self "Don't goof, don't goof." And the strain of keeping the foot off the throttle lap after lap and then for more laps exerting just the right pressure. It told on Miles. At the end of the race he collapsed across the side of the car, head on arms and remained that way for long minutes, unable even to gulp at the quart of cold milk that car-owner Otto Zipper held out for him.

What did Riverside, 1959 prove? Several things. It proved beyond a shadow of a doubt that big-money road racing can work if properly handled. It also proved that cooperation among all those concerned is a must. Riverside is, leaving the L.A. *Times* out of it for the moment, a joint effort by the California Sports Car Club, the SCCA and USAC. The whole thing works like a well-oiled machine from the actual organization point of view. It also proves that Simon-pure amateurism is a lost cause. No one was tainted by the scent of money and forget you not that this was the largest single purse outside of Indianapolis. There was less stupid, over-the-head driving than one sees in the average lily-white club or regional meeting. Finally it proved the need on the part of all motor racing organization for positive public relations. Promotion paid off handsomely and, in contradistinction to another large promotion at another time and place, was tastefully done. The result, while not exactly of Indianapolis proportions, was as large a crowd of interested and well-behaved spectators, 80 thousand, to be exact, as has ever attended a road race in the U.S. Riverside was, in brief, the biggest, most successful road race this country has seen in this decade.

—jpc



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The Golden Plate

from page 93

amateur status, and had a narrow escape when his car threw a tire at speed.

As the creator and patron of the Targa Florio, Vincenzo Florio played an indirect part in developing the prowess and furthering the careers of many great drivers. But there was one man in particular, Felice Nazzaro—the Nuvolari of his day—on whom Florio's influence was by no means indirect and likely decisive. Nazzaro and Florio met when Felice, a young Fiat employe of no great importance, was sent to Palermo to deliver a car Florio had ordered. About equal in age but a world apart socially and financially, the pair shared a burning enthusiasm for motoring and immediately became friends. The upshot was that Florio persuaded Nazzaro to quit his Fiat berth, stay in Sicily and take charge of the expensive and rapidly growing Florio collection of automobiles. Nazzaro complied, and gained his first circuit racing experience in a series of *in camera* beatups that his new employer staged in Favorita Park, Palermo, exclusive to Vincenzo's playboy friends, Vincenzo himself, and his chauffeur-mechanic, Felice Nazzaro.

From there, Nazzaro ascended the ladder of fame and fortune hand over hand, erupting to precocious stardom at the wheel of Fiats provided at first by Florio, later under official Fiat sponsorship. He won the French Grand Prix twice, the Targa twice—once for Fiat, then with a car of his own make, the Nazzaro, on the *Giro di Sicilia* course. This 'round-the-island gambol in 1913, made at a speed that broke the record for the 600 mile Giro by nearly 7 mph, marked the only occasion before or since that a new and untried make had won Florio's prize of gold at its first attempt in competition.

Vincenzo Florio, the man who *was* a motor race, took three turns in the dual role of Targa Florio organizer and driver; and once, in 1909, he only just spared himself the embarassment of receiving as well as donating his Targa. Perhaps luckily in a way, a fellow called Ciuppa (Spa) nosed in exactly one minute ahead of the *padrone* and his big Fiat.

After that, with time subtracted for two wars and a spell he spent putting the Monza track on its feet, Florio applied himself devotedly to the direction and welfare of his beloved mountain race. When he died, Italy's veterans of motorsport said the Targa would die with him. But the happenings of May 24, 1956, when Porsche made a 1-2-3-4 sweep on the modern Madonie course, recalling the days of the Alfa Romeo steamroller, proved them wrong. Vincenzo's last wish had been that his grandson, another Vincenzo, should take it from there. He's doing it. The king, alas! is dead. Long live the king.

—d m

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